



*Kotzebue from the air*



*Under a surface layer of meltwater, the ice in Kotzebue Sound was still solid in May*



*Evening travel on the ice*



*Ice fishing on a pleasant May evening*

**Northwest Arctic Borough Oil Spill Workshop:  
Natural Resource Damage Assessment (NRDA) & Environmental Response Management  
Application (ERMA<sup>®</sup>)**

**May 22-23, 2012**

**National Oceanic and Atmospheric Administration  
Coastal Response Research Center**



## **Executive Summary**

On May 22-23, 2012, at the request of the Northwest Arctic Borough (NWAB), the Coastal Response Research Center (CRRRC) and NOAA's Office of Response and Restoration (ORR) hosted an oil spill workshop in Kotzebue, Alaska. More than 50 participants from all 11 communities in the NWAB, plus about 20 agency or non-governmental (NGO) representatives, attended the workshop.

The goals of this meeting were to:

- Discuss community involvement in oil spill response, natural resource damage assessment (NRDA) and restoration/recovery;
- Integrate local community and Inupiaq traditional knowledge into the Arctic Environmental Response Management Application (Arctic ERMA); and
- Enhance relationships between local communities and government agencies regarding planning and preparation for potential oil spill response, NRDA and restoration/recovery.

During a series of breakout groups, participants articulated their concerns about potential oil spills in the region and developed ideas and recommendations for conducting NRDA, planning restoration, and improving Arctic ERMA (<https://www.erma.unh.edu/arctic/erma.html>). This report presents the results of the discussions, including the breadth and diversity of opinion, articulated at the workshop. The summary of the discussions describes priority concerns of community members and general recommendations to address some of the concerns.

Priority Concerns:

- Implications of harsh environmental conditions (ice and severe weather) on spill response, restoration and recovery
- Delays in response (e.g., travel distances for spill response equipment)
- Limitations in spill infrastructure and logistical support (e.g., vessels, fuel, boom and other supplies, equipment maintenance; food, housing, waste management) as well as ports, harbors and USCG facilities
- Increased disruption to subsistence practices and food security. The subsistence lifestyle in the NWAB is essential for human health, spirituality, and maintenance of Inupiaq culture
- Ecological and long term effects of oil on local populations, migratory species and sensitive habitats (e.g., lagoons, river mouths, hunting areas)
- Lack of training and infrastructure (e.g., equipment) for the Northwest Arctic villages and existing local spill response teams, especially with respect to off-shore response methods
- Lack of community inclusion in decision making for response, including use of local knowledge

General Recommendations:

- Build local spill response capability
- Incorporate local community and Inupiaq traditional knowledge (subsistence and ecological status) into tools and ensure community oversight in its uses
- Determine baseline conditions of species and habitats likely to be affected by oil spills

- Begin restoration planning now, involve locals (e.g., Northwest Arctic Borough, local emergency planning committee (LEPC's), Economic Development Commissions (EDCs) and Planning Commission in developing specific project ideas)

These concerns and recommendations will be provided to the State of Alaska and the U.S. Coast Guard (USCG) for their use in planning oil spill response in the region. The report findings will be used by NOAA and other agencies to establish priorities for NRDA and restoration. NOAA will also use the report to establish priorities for data to augment in Arctic ERMA.

## **Acknowledgements**

The CRRC and NOAA gratefully acknowledge the Organizing Committee (OC) members and breakout group facilitators for playing a crucial role in the success of the workshop.

The OC members included:

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The Group Leads were: Mary Baker, Robert Taylor, Amy Merten, Gary Shigenaka and Sarah Allan. The Group Recorders were: David Clark, JD Ross, Elspeth Hilton, Hayley Pickus and Joe Inslee.

The CRRC also gratefully acknowledges the hard work and dedication of all 77 participants (Appendix B). More information is available at [www.crcc.unh.edu](http://www.crcc.unh.edu).

This workshop was sponsored by: NOAA ORR, CRRC and OSRI.

## **Introduction**

Changing conditions in the Arctic are increasing the likelihood of an oil spill. The loss of sea ice, increasing demand for energy, and development of offshore oil and gas resources will increase ship traffic and other activities that increase the risk of a spill. Arctic communities rely on natural resources for cultural and subsistence use and these resources will be affected in the event of a spill. The rapid changes in physical and biological systems that are occurring in the Arctic provide a challenging backdrop for evaluating the ecological effects of spilled oil. Early planning for spill response and natural resource damage assessment (NRDA) requires coordination with local communities to ensure that: protection priorities are correctly identified, appropriate baseline data for a NRDA are collected, ephemeral data collection is planned, and natural resources and their services are evaluated and restored.

As a follow up to two earlier CRRC workshops (Arctic ERMA Workshop April 5-6, 2011 Anchorage, Alaska and NRDA in Arctic Waters: The Dialogue Begins April 20-22, 2010 Anchorage, Alaska), NWAB Planning Department representatives asked NOAA and CRRC to consider hosting similar workshops in the Arctic communities. The priority was to discuss local

involvement in NRDA and incorporation of local and traditional knowledge into ERMA. This document provides a summary of the discussions at the May 2012 NWAB Oil Spill Workshop.

The goals of the workshop were to:

- Discuss community involvement in spill response, NRDA, and restoration/recovery;
- Integrate local community and Inupiaq traditional knowledge into Arctic ERMA; and
- Enhance relationships between local communities and government agencies regarding planning and preparation for potential oil spill response, NRDA and restoration/recovery.

Responding to and cleaning up oil spills is the responsibility of the USCG, Alaska Department of Environmental Conservation and/or U.S. EPA (depending on the location and source of the spill). The USCG Captain of the Port (COTP) is the pre-designated Federal On-Scene Coordinator (FOOSC) for oil spills in the Coastal Zone. Management of spill response is generally conducted using the Incident Command System (ICS), which is a standardized on-scene emergency management construct to address complex incidents without being hindered by jurisdictional boundaries. ICS is the combination of facilities, equipment, personnel, procedures, and communications operating within a common organizational structure, designed to aid in the management of equipment, people, and money during incidents. Response to oil spills is guided by the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). ICS brings together the functions of the Federal government, state/local governments, and the responsible party in order to achieve an effective and efficient response.

For spills in Alaska, a Unified Spill Response Plan provides a comprehensive pollution response doctrine that defines the organizational and procedural framework for the oil spill response network. Ten Sub-Area Plans supplement the Unified Plan and describe geographic specific strategies for a coordinated Federal, state and local response. In addition, a Joint Marine Pollution Contingency Plan with Canada supplements the Unified Plan. The USCG maintains limited oil spill response equipment including boom and skimming systems, as does the Alaska Department of Environmental Conservation and the Navy Supervisor of Salvage. Oil spill response organizations (OSROs) also maintain response capacity that can be accessed by the USCG.

Under the Oil Pollution Act of 1990, parties responsible for spilling oil are liable for the cost of responding to and cleaning up the spill. In addition to clean up, polluters are also liable for the cost of restoring public natural resources that are harmed by a spill. Natural resources are protected by the government under a long-standing common law tradition known as the public trust doctrine, which dates back centuries even before the United States existed. Under the public trust doctrine, natural resources are to be managed for the benefit of all. When public resources are harmed by a spill, governments may seek compensation for the harm. This is done in two steps: (1) by assessing the harm; and (2) by determining how and what restoration will occur. Compensation for injury is intended to restore the natural resources to their condition before the spill and to compensate the public for the lost use of those resources. Because parties responsible for a spill are only liable for the harm from the oil (and for harm from response activities), it is extremely important to understand the condition of the natural resources in the absence of a spill (“baseline”). In a changing environment, agencies must be able to distinguish between harm to natural resources from oil, and those from other causes.

NRDA is a legal process that results in the filing of a legal claim that is either resolved through a negotiated settlement or through the judicial process. Government agencies must demonstrate that there is a connection between the oil spill, a pathway for oil to reach natural resources, exposure to animals or their habitat, and an ecological effect and/or loss to people using the resources. The outcome of a NRDA should be restoration that compensates for losses. This restoration is typically focused on improving habitat, but also can address losses of resources used by humans.

ERMA is an online mapping tool that serves as a single point of access for environmental response information. It integrates both static and real-time data, such as Environmental Sensitivity Index (ESI) maps, ship locations, weather, and ocean currents, in a centralized, easy-to-use format. It provides environmental responders and decision-makers ready access to relevant data for oil spill drills, planning, response, assessment, and restoration, as well as for other incidents and natural disasters. The system incorporates data into a fast, user-friendly Geographic Information System (GIS) that is accessible via internet at a command post as well as to people in the field and at other locations. ERMA was developed by the National Oceanic and Atmospheric Administration (NOAA) and the University of New Hampshire (CRRC and the Research Computing and Instrumentation Center) along with the Environmental Protection Agency, USCG, and the Department of the Interior in a cross-agency effort. Originally developed for the Portsmouth, NH region, the ERMA prototype was tested during area response drills, where it proved to be effective at providing data transparency and simple to operate for multiple users.

ERMA enables a user to quickly and securely upload, manipulate, export, and display spatial data, resulting in high-impact visualizations of information for solving complex environmental response and resource management issues. Non-GIS experts can use ERMA to view, manipulate, and analyze data on maps. The application is based on open source software (PostgreSQL/PostGIS, MapServer, OpenLayers) that ensures compatibility with other commercial and open source GIS applications. Because the ERMA platform is web-based, it can easily bring together various types of information, providing a common operational picture for all individuals involved in incident response operations and improving communication and coordination among responders and stakeholders. ERMA provides environmental resource managers with the information necessary to make informed decisions. The Arctic ERMA project grew out of a strong desire by NOAA and its interagency partners (especially the Department of the Interior) to focus on preparedness for Arctic emergency response due to changing ice conditions and increased energy and transportation activities.

### **Workshop Organization and Structure**

The workshop; held at the Northwest Arctic Heritage Center in Kotzebue, Alaska on May 22-23, 2012; consisted of plenary sessions where invited speakers gave presentations (Appendix F) on spill response, NRDA, and the ERMA tool. More than 50 participants from all 11 communities in the NWAB, plus approximately 20 agency and NGO representatives attended the workshop. Five breakout groups discussed specific questions regarding: (1) concerns about spills and spill response; (2) approaches for NRDA (including how to assess baseline conditions in a changing

environment); (3) ideas for restoring injured resources and affected human uses; and (4) ways of improving the Arctic ERMA tool to incorporate local knowledge and make it useful as a communication mechanism. The workshop agenda (Appendix A), participants (Appendix B), and breakout session questions (Appendix C) were identified and developed by an Organizing Committee representing local and Federal government entities and NGOs. The Organizing Committee identified participants from local communities, NGOs, industry, the private sector, response organizations, academia, natural resource trustee agencies, and state and local governmental entities who have a vested interest and experience in the Arctic and/or oil spills, and NRDA (Appendix B). The workshop was organized around three major topics: (1) spill response; (2) NRDA; and (3) Arctic ERMA. The workshop participants addressed questions relating to these topics in breakout groups (Appendix D). After each breakout session, the groups came together in a plenary session and summarized their discussions for the larger group (Appendix E). This report contains a summary of the groups' recommendations and ideas. On the final day of the workshop, participants convened to summarize their findings and conclusions. Several larger group sessions created the opportunity to share and discuss ideas. It should be noted that the NWAB is not a monolithic community, and the conclusions and ideas presented here are not consensus recommendations, but are an attempt to represent the breadth and diversity of opinion presented at the workshop.

### **Summary of Breakout Group Discussions**

Each breakout group discussed the same questions. Notes from each breakout group and large discussions were synthesized according to general topic.

#### **1. Improving Spill Response**

Workshop attendees discussed concerns regarding spill response. These concerns can be summarized as:

- Implications of the harsh environmental conditions (e.g., ice and severe weather)
- Delays in response (e.g., travel distances for spill response equipment and responders)
- Limitations in spill infrastructure and logistical support (e.g., vessels, fuel, boom and other supplies; maintaining equipment; food; housing; waste management)
- Need for training at the village level
- Access to the most up-to-date information about spill response
- Need for local participation in response, particularly as the Arctic is the homeland for Inupiaq peoples and communities.

Breakout groups developed a variety of ideas and recommendations for maximizing the effectiveness of spill response to address these concerns. The highest priority and most significant recommendations related to creating local response capability for the first few days of a spill. There was a strong desire for local communities and villages to become prepared for a spill. Specific ideas to build desired community spill response capacity include: establishing village or borough response teams; establishing spill response agreements in advance; creating a borough response plan template to customize for each village; and establishing a Regional Citizens Advisory Council for the NW Arctic. It was also noted that tribal government to government consultation is required for an effective response.

Ideas for addressing logistics and infrastructure limitations include: creating a cache of extra parts for critical equipment; maintaining an inventory of what appropriate equipment is already available in the community (what, whose, where); creating the ability to provide “guide” services for responders, especially in remote areas or during poor weather; and establishing agreements to use assets of NANA and Local Emergency Planning Committees (LEPCs).

Ideas and recommendations for improving spill response training include:

- Build on existing training for disaster response, search and rescue, and firefighting
- Educate students to be responders
- Track who is trained
- Conduct training through the NWAB, USCG Auxiliary, and LEPCs
- Include specific scenarios in training
- Include training on: regulations and cleanup practices; use of ERMA; effects of burning, dispersants and decontamination procedures; oil persistence; fate and behavior; long term effects of dispersants; and basics of effects of oil on Arctic species
- Provide more drills (including NRDA) and include more time to provide local input.

Ideas and recommendations for access to updated information include:

- Provide a directory of spill response contacts, and which agencies have specific responsibilities
- Update ESI maps
- Prepare seasonal response plans
- Share facility contingency plans
- Improve ability to respond on private land (create advance agreements with native allotment owners)
- Provide daily information/updates about the spill response to the community via ERMA
- Include more local representation in protection strategy development and prioritization
- Create a public health plan for spill response (include hospital staff)
- Investigate bioremediation response options
- Use traditional knowledge of currents in trajectories and planning
- Address concerns about: protection of archeological information and culturally-sensitive areas during a response; the possibility of sinking oil; caribou feeding on oiled grass, concerns that response will do more harm than good (e.g., on the tundra).

## **2. Protection/Response and NRDA Priorities**

Workshop attendees had lengthy discussions of their concerns regarding the environmental and cultural effects of oil spills. These concerns can inform protection priorities for spill response, and help identify important NRDA metrics. The highest priority and most significant concern seemed to be for the potential for injury to food supply and subsistence food practices (food security), including having to travel farther to hunt and gather food. Traveling farther for food has attendant economic and safety implications since the price of fuel is very high and traveling long distances increases risk of injury or stranding. The subsistence lifestyle in the NWAB is

essential for human health, spirituality, and maintenance of Inupiaq culture. It is also essential for the economy of the NWAB and region (i.e., subsistence is the economic base). Even the perception of contamination will keep people from hunting, and this aversion may last a long time. Seal oil is a particularly important food resource. The possibility of a regulatory response to restrict harvest or close fisheries after a spill would also affect food security.

The possibility of effects to important biota and plants is also of concern. Some key species and effects mentioned during the workshop include:

- Lowland plants
- Caribou, river otters, beavers, moose
- Birds and eggs (seagulls, ducks, geese, swans, eider, yellow billed loon) (including migration behavior changes)
- Plankton and microorganisms
- Direct effects on whales (beluga and bowhead), seals (spotted, ringed, bearded and especially Ugruk), and walrus - including disease, feeding behavior, pregnancy rates
- Whale and seal migration in Hanna Shoal, Barrow Canyon, Wrangell Island, and along ice edges
- Fish (salmon, sheefish, pike, whitefish, herring, trout, smelt, grayling)
- Mud shark
- Crabs
- Walrus prey (clams)
- Polar bear
- Energy transfer between ecosystem components; disruption of food web relationships, especially the ice-based food web and nutrient cycling.

The possibility of contamination of specific sensitive habitats was also of concern to workshop participants. Key habitats of concern include:

- Benthos
- Lagoon systems
- River mouths
- Watersheds
- Barrier islands
- Lowlands
- Erosion of coastal habitat
- Hunting and camping areas
- Bird nesting areas.

In addition to food security and ecological effects, there were numerous social and cultural impacts of concern. These include:

- Maintaining native language proficiency
- Maintaining hunting and fishing practices from generation to generation
- Social disruption, domestic violence, and people wanting to leave communities
- Cascading effects on inland communities that share coastal natural resources
- Impacts on summer fish camps
- Impacts to sales of arts and crafts made from subsistence resources

- Access to traditional art and clothing materials
- Educating young people about traditions
- Employment opportunities
- Maintenance of celebrations and traditional dances
- Protection of water pumping stations (upriver spills from pipelines are also of concern).

Finally, the possibility that oil spills could affect human health was of great concern, including increasing prevalence of cancer and other diseases, and increases in mental health disorders. Also of concern was the possibility that oil spills could increase the existing negative effects of westernization on human health.

### **3. Coordinating NRDA Activities**

Agencies that are responsible for NRDA are very interested in developing and maintaining relationships with the NWAB communities and their representatives. The conversations at the workshop brought forth a number of considerations in developing a productive and mutually beneficial relationship between the agencies and communities of the NWAB. One of the core suggestions made by community members was that communication flow be enduring and two-way. Community members and officials want to learn more about NRDA and associated activities. Suggested mechanisms to facilitate this communication include: radio, face-to-face meetings, newsletters, and Facebook. Coordination with the regional Elders Council, the Inupiaq Language Commission, the Subsistence Committee for the Red Dog mine, NANA, and other regional entities will enhance communications and facilitate building trust between agencies and communities. Formal consultations with tribal entities are also required.

There is a strong perception among community members that information sharing between local communities and agencies has not been reciprocal and balanced (i.e., Agencies take information and data, but do not deliver synthesized information or report on how data was used in return). Communities may be willing to share subsistence and traditional information, but there is a need to protect sensitive subsistence and cultural information. This need must be respected. Agencies must be accountable to the communities who supplied information which is used in a spill response or NRDA.

Other suggestions for improving communications between agencies and the communities include: establishing community liaison positions; holding informal conversations over food; visiting hunting, fishing, and gathering camps (spend 3-4 days); structuring conversations around maps; improving listening skills; going hunting with locals (including offering to pay for gas); gathering women's perspectives as well as men's; and simplifying technical information for village residents (consider two languages).

Conducting NRDA in the Arctic will be challenging because of the remoteness of locations that may be affected, severity of weather, and limitations in infrastructure and equipment available locally. Logistics of sampling are of special concern - typical boats in the area are 16 - 26 feet long with 150 horsepower outboard motors, most are used for setting gill nets. Red Dog Mine's port has only a 15 foot draft and cannot be used during severe weather. Providing food, housing,

and waste management during response and NRDA activities are also concerns for local officials. Community members may be willing to participate in NRDA sampling activities.

#### **4. Determining Baseline Condition of Natural Resources**

Since the goal of NRDA is to restore the condition of natural resources to “baseline” status and compensate for lost use and services; identification of the health and status of Arctic natural resources in the absence of a spill (i.e., baseline) is important. Determining and quantifying injury from a spill requires documentation of a connection between: the release, a pathway to receptors, exposure to oil, and adverse effects. The Arctic is a rapidly changing environment. The workshop attendees recognized that climate change has the potential to affect many of the priority assessment metrics listed above. Local observations of indicators of climate change reported by workshop attendees include: changing water levels; faster snow melt; altered river hydrology and flow timing (e.g., at Ambler); flooding tundra; and melting permafrost. Concerns were raised about inaccurate baseline surveys of animals and physical parameters (e.g., radon and radiation).

Recommendations and ideas for evaluating baseline for NRDA purposes include:

- Build on historical and ongoing EPA river monitoring (contaminant concentrations)
- Include priority NRDA baseline needs in research programs
- Include subsistence mapping project information being gathered and summarized by the NWAB
- Include local representatives in design and implementation of baseline studies
- Incorporate traditional knowledge into baseline assessments
- Fund a collaboration project to work with subsistence hunters to document, track and report changes over time in location, migration and health of animals
- Collect data from women in the communities on the health of the animals they clean (e.g., health of organs)
- Conduct baseline studies over several years
- Analyze causes of harmful algal blooms
- Determine status of health and populations of priority species
- Incorporate biological changes being seen in hunted species. (N.B., The women of the communities have a vast wealth of knowledge regarding the anatomy of hunted species.)
- Evaluate migration routes of sea mammals (including birthing areas).

#### **5. Ideas for Restoring Arctic Resources and Services**

The outcome of any NRDA process is a suite of restoration projects that compensate the public for injuries to natural resources and the services they provide. For most of the attendees, restoration to compensate for oil spill injuries was a new concept. Indeed, it was expressed repeatedly that the “best form” of restoration is to ensure a spill does not happen at all. Workshop attendees discussed the issues associated with restoration and provided some feedback on general considerations for such planning in the NW Arctic:

- Apply the values of the locals in developing restoration plans (i.e., sharing, concern for the future, consideration for the children and future generations, spiritual connections to the land and ocean, giving back to the resource)

- Use councils and existing groups to share information (N.B., NRDA information should be public, if possible)
- Plan restoration for a 40-50 year period
- Provide examples of restoration from other spills, including international ones, as well as those in Alaska, and the Gulf of Mexico, to learn what has not recovered and why
- Partner with the North Slope Borough to develop restoration options
- Establish an advance restoration fund to address impacts of drilling
- Hold locally based discussions of possible negative consequences of restoration
- Include multiple villages in soliciting restoration ideas
- Include biocultural resiliency as a restoration goal—improve the resilient nature of connections between people and the ecosystem
- Educate outsiders about spiritual connections to the land and ocean
- Apply traditional harvesting methods (e.g., leaving some eggs, letting some caribou pass before hunting) in restoration/conservation projects
- Incorporate traditional knowledge in selecting sites for restoration that are important for subsistence and maintenance of human health
- Improve resiliency/adaptability, not trying to keep things as they were
- Create an ecosystem model to inform restoration.

It is important to note that participants discussed the fact that assigning discreet monetary value to resources is not appreciated by locals. In addition to providing some general recommendations and advice, the working groups developed specific suggestions to consider when developing restoration projects that would compensate for the *ecological injuries* to natural resources, depending on which environments or species were affected. Habitat restoration and methods of enhancing affected species will be challenging in the changing Arctic environment.

Specific ideas for addressing ecological injuries include:

- Establish hatcheries/restocking programs (e.g., musk ox and sea otter introduction)
- Find ways to promote rapid spring growth of krill and other species at the base of food chain when less ice is present
- Develop artificial ice-floating platforms for seals and walrus
- Place fish spawning reefs
- Create rock haulouts for seals or walrus (combine with tourist and outreach opportunities)
- Improve protection and management of subsistence hunting and fishing areas and species
- Protect and conserve affected species or areas
- Establish the Chukchi Sea as a national treasure area, but allow subsistence use
- Control other sources of contaminants: mining (cyanide, copper, and mercury), human waste, waste oil, bilge water, air emissions, spills around tank farms (groundwater contamination), asbestos, landfills, metal recycling, drilling fluid, old military sites, sulfites, and marine debris/plastics. Enhance opportunities for villages to properly dispose of hazardous materials (e.g., used electronics).

Natural resources and humans are inextricably connected in Arctic communities. Improving the condition of natural resources will help communities recover from the effects of oil spills. There are also many ongoing activities and projects that could be expanded to compensate for lost *cultural use* of natural resources. Selection of individual projects would need to be tailored to address specific losses resulting from particular spills. Ideas and recommendations include:

- Find ways to address social disruption and keep the “thinkers” and young people in the community
- Teach traditional celebrations (e.g., footraces, dances)
- Teach subsistence practices and survival techniques
- Provide support for the regional elders council
- Support Chukchi Campus adult classes in net making, and Inupiaq studies
- Support school or community field trips
- Support science fairs with a restoration focus
- Allow locals rights to their own lands
- Provide funding to sustain culture (e.g., more language immersion schools, culture camps)
- Maintain and transfer hunting knowledge: educate young people as to proper marine mammal (i.e., whales, seals, walrus) hunting methods (prepare “virtual hunt” curriculum materials- how to shoot whales so they can be recovered, how to take apart an animal, sharing hunt with others).

Workshop attendees also had concerns about maintaining and enhancing the *subsistence harvest and hunting*, and providing for a replacement food supply during times when contamination prevents use of the resources. Supporting *economic activity* in the communities may also provide benefits to offset losses. Specific project or activity possibilities to address these concerns include:

- Offset increased cost of gas for hunting, provide fuel subsidies
- Provide replacement food supplies
- Reduce hunting and fishing conflicts with outside groups (e.g., sport hunting and fishing), especially during the upper Kobuk caribou hunt and sheefish capture
- Improve access to wild areas (improve roads/trails, especially in Selawik)
- Implement temporary conservation measures
- Enhance ability to trade and share resources between communities
- Transport hunters to other areas to maintain food supplies
- Offset freight charges through airport enhancements
- Implement alternative energy projects (e.g., wind, hydropower)
- Increase capacity to receive fuel shipments (e.g., port improvements)
- Expand job training programs
- Address coastal erosion (especially in Kivalina)
- Fund local infrastructure to reduce fuel costs-perhaps an oil refinery.

## **6. Improving Arctic ERMA**

Breakout groups discussed the utility of the ERMA tool in the context of providing and sharing information during spill response and in support of NRDA activities. The consensus of the workshop attendees seemed to be that Arctic ERMA has potential to improve communications and information sharing among and between communities and agencies. Local people and Inupiaq leaders are interested in contributing to ERMA and other planning efforts because it helps protect their communities and subsistence way of life. Attendees provided feedback on how the Arctic ERMA project could be useful for their participation in spill response and NRDA. A stand-alone (desktop) version of ERMA for community use would be beneficial since local web access is not reliable and robust. Coordinating with existing and prior mapping efforts (including Borough Subsistence Mapping projects) could make the project more efficient and useful. For example, subsistence use surveys were conducted for development of Red Dog Mine. Local and traditional knowledge on other topics should also be included in ERMA. The NWAB is working on a data sharing agreement that would protect sensitive local knowledge from unauthorized and inappropriate use. Providing peer review, perhaps through village advisory committees, would also improve accuracy of information. The display of metadata and the ability to upload and report observations were also of interest to community members. Recommendations and ideas related to ERMA outreach include conducting training at the village level (including in schools), and working with multiple existing committees, councils, and meetings, including the:

- Regional Elders Council
- Inupiaq Language Commission
- Teck-NANA Subsistence Committee for the Red Dog mine
- Existing regional conferences (e.g., NANA, NWAB)
- Various animal commissions (e.g., Eskimo Whaling Commission; Alaska Eskimo Whaling Commission; Ice Seal Commission; Beluga Whale Commission; Nanuuq commission, Bird Commission)
- State Fish and Game Advisory Committees
- Federal Subsistence Regional Advisory Committee (RAC)
- Area Advisory Committees.

Further it was suggested that NOAA should better communicate what ERMA is. Perhaps NOAA can work with village representatives to develop an “ERMA 101” introduction which is specific to the interests of the community.

Specific information and data to add to Arctic ERMA include:

- Land ownership and access points
- Shelter locations
- Small boat routes
- Snow machine routes
- Place names (USGS and Inupiaq place names)
- Vegetation types
- Watershed information
- Intertidal zone mapping

- Nearshore substrate, aquatic vegetation
- High density vessel traffic areas and routes (e.g., Crowley, Foss, and Northwestern Maritime)
- Coastal management plans

## **Workshop Summary Conclusions and Recommendations**

### Priority Concerns:

- Implications of harsh environmental conditions (ice and severe weather) on spill response, restoration and recovery
- Delays in response (e.g., travel distances for spill response equipment)
- Limitations in spill infrastructure and logistical support (e.g., vessels, fuel, boom and other supplies, equipment maintenance; food, housing, waste management) as well as ports, harbors and USCG facilities
- Increased disruption to subsistence practices and food security. The subsistence lifestyle in the NWAB is essential for human health, spirituality, and maintenance of Inupiaq culture
- Ecological and long term effects of oil local populations, migratory species and sensitive habitats (e.g., lagoons, river mouths, hunting areas)
- Lack of training and infrastructure (e.g., equipment) for the Northwest Arctic villages and existing local spill response teams, especially with respect to off-shore response methods
- Lack of community inclusion in decision making for response, including use of local knowledge

### General Recommendations:

- Build local spill response capability
- Incorporate local community and Inupiaq traditional knowledge (subsistence and ecological status) into tools and ensure community oversight in its uses
- Determine baseline conditions of species and habitats likely to be affected by oil spills
- Begin restoration planning now, involve locals (e.g., Northwest Arctic Borough, local emergency planning committee (LEPCs), Economic Development Commissions (EDCs) and Planning Commission in developing specific project ideas

## **Next Steps**

This report and its conclusions will be provided to the State of Alaska and U.S. Coast Guard for their use in planning oil spill response in the region. It will be distributed to NGOs as well as elected officials and Sea Grant agents. The NWAB will also disseminate the report. The report findings will be used by NOAA and other agencies to establish priorities for NRDA and restoration. NOAA will also use the report to establish priorities for data to include in Arctic ERMA. The delivery of the workshop report will serve as one mechanism to continue and further develop the relationship between agencies and the NW Arctic communities. A similar workshop is also being planned for the North Slope Borough, to be held in Barrow in the Fall 2012.

## **Appendix**

- A: Workshop Agenda
- B: Participant List
- C: Breakout Questions
- D: Breakout Groups
- E: Breakout Group Notes and Report Outs
- F: Presentations

# Northwest Arctic Borough: An Oil Spill Workshop

Northwest Arctic Heritage Center  
171 3rd Avenue, Kotzebue, AK  
May 22-23, 2012

## Goals:

- To discuss community involvement in spill response, natural resource damage assessment (NRDA) and restoration/recovery
- To integrate local community knowledge into Environmental Response Management Application (Arctic ERMA®)
- To enhance relationships between local communities & government agencies regarding planning and preparation for potential oil spill response, NRDA and restoration/recovery

## AGENDA - DAY 1

- 9:00 AM **Opening Prayer**  
Local Elder
- Welcome - Northwest Arctic Borough**  
Mayor Siikauraq Martha Whiting
- 9:15 AM **Welcome and Overview of Meeting**  
**Overview of Oil Spill Response, Planning & Preparation, Arctic ERMA®, NRDA and Restoration/Recovery**  
Nancy E. Kinner, *UNH Co-Director, CRRC*  
Amy Merten, *NOAA Co-Director, CRRC and Chief NOAA's Spatial Data Team*
- 9:30 AM **Goals and Expectations of This Meeting**  
Ukallaysaaq Tom Okleasik, *NWAB*
- 9:40 AM **Participant Introductions & Expectations**
- 10:20 AM **Break**
- 10:30 AM **Introduction to Spill Response for Offshore Oil Developments/Exploration in the Chukchi Sea**  
Francis Schiano, *USCG*
- 10:50 AM **Ecological Risk Assessment for the Northwest Arctic Subarea Contingency Plan**  
Mary Baker
- 11:00 AM **Introduction to Arctic ERMA®**  
Amy Merten
- 11:30 AM **Lunch (provided)**
- 12:30 PM **Small Group Breakout Session I: Discussion of Oil Spill Response & Arctic ERMA®**  
*Theme: Logistics of spill response, concerns and how local communities can most effectively participate and ERMA® can help*  
**Breakout Group Questions:**
- What specific concerns do you have relative to planning and preparation for spill response?
  - What specific concerns do you have relative to spill response implementation and management?
  - What are your initial reactions to the Arctic ERMA Prototype?
  - How could the tool be useful for community involvement in spill response?
  - What information would you like to see included in the tool to support response decisions?
  - What are best practices for community involvement in spill response, planning, and preparation?
- 2:30 PM **Break**
- 2:45 PM **Group Reports to Plenary Session**
- 3:30 PM **Introduction to Natural Resource Damage Assessment (NRDA), Restoration/Recovery**  
Mary Baker, *NOAA*
- 4:30 PM **Adjourn meeting**
- 5:00 PM **Presentation: "How can science improve decision-making in the Arctic?"**  
Fran Ulmer, *USARC Chair*  
*(This will be held at the Nullagvik Hotel's conference room. Reception to follow)*
- 6:30 PM **Movie Night at the Heritage Center (optional)**

AGENDA - DAY 2

- 8:30 AM **Opening Prayer and Announcements**  
Ukallaysaaq and Nancy Kinner
- 8:45 AM **Arctic ERMA® in NRDA and Restoration/Recovery**  
Mary Baker, Amy Merten
- 9:15 AM **Small Group Breakout Session II: Discussion of NRDA, Restoration/Recovery**  
*Theme: Logistics of NRDA, concerns, how local communities can most effectively participate, and how ERMA can help*
- Breakout Group Questions:**
- What effects of oil spills most concern you (for example, health and use of natural resources)?
    - ◊ Marine mammals
    - ◊ Birds
    - ◊ Fish
    - ◊ Crab or other shellfish
    - ◊ Land mammals
    - ◊ Other cultural concerns (for example, education, language, arts)
  - Are there special habitats or specific areas that you are most concerned about? (for example, sensitive areas, historical sites, camp areas)
  - Given the changing Arctic environment, what background/baseline information do you think we need to consider about the health of the environment before a spill occurs?
  - How could the ERMA tool be useful for evaluating effects of spills?
  - What information would you like to see included in the tool to support evaluation of effects?
  - What are best practices for community involvement in evaluating effects?
- 10:45 AM **Break**
- 11:00 AM **Small Group Breakout Session III: Discussion of NRDA, Restoration & Recovery**  
*Theme: Exploring restoration options and how ERMA® can help*
- Breakout Group Questions:**
- What specific concerns do you have relative to restoration and recovery?
  - Are there examples of habitat areas that could be improved?
  - Are there other sources of contamination that could be controlled?
  - What traditional methods of restoration and recovery are practiced?
  - What could be done to sustain cultural and subsistence practices that might be affected by oil?
  - How could the ERMA tool be useful for planning restoration?
  - What information would you like to see included in the tool to support restoration planning?
  - What are best practices for community involvement in restoration and recovery?
- 12:30 PM **Lunch (provided)**
- 1:30 PM **Group Reports to Plenary Session**
- 2:15 PM **Small Group Breakout Session IV: Populating Arctic ERMA® with Data/Information**  
*Theme: Determining which information would be most helpful*
- Breakout Group Questions:**
- What data sets do not yet exist, but are needed to support planning or decision making?
  - What are the output requirements and/or functionalities of these data?
  - Are there any access restrictions to these data?
  - What are the highest priority data needs?
  - Where do important existing data sets currently reside?
- 4:15 PM **Wrap Up**
- 5:00 PM **Adjourn**

# Northwest Arctic Borough: An Oil Spill Workshop

Northwest Arctic Heritage Center  
171 3rd Ave, Kotzebue, AK  
May 22-23 2012

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**Northwest Borough Workshop**  
*Breakout Groups*



Group A	Group B	Group C	Group D	Group E
Paul Eaton	Bob Puya Schaeffer	Roy Barr	Frank Schiano	Hayley Pickus
Pauline Harvey	Jimmy Stotts	Chris Eckert	Colleen Swan	Austin Swan
Christopher Kobus	Robert Taylor	Ella Ede	Veronica Varela	Enoch Mitchell
Ukallaysaaq Tom Okleasik	Alex Whiting	Deborah Glickson	Carolina Behe	Carol Wesley
Michael Haller	Darcy Dugan	Alison Kelley	George Douglas	Oral Hawley
Clyde Ramoth	Irvin Newlin	Christopher Krenz	Craig Gerlach	Derek Martin
Walter Parker	Raymond Lee Jr	W. Scott Pegau	Tim Gavin, Jr.	Mary Reeve
Erika Ammann	Delores Barr	Cheryl Rosa	Alvin Ashby	Lee Ballot, Sr.
Zach Stevenson	Melissa Becker	Jason Rutman	Michael Oliver	Lori Krumm
Patsy Stalker	Elizabeth "Kookie" Ito	Josephine Oke	Peter Neitlich	Marci Johnson
Billy Lee	Lisa Pekich	Lincoln Saito	Mark Fesmire	Christopher Shockley
Amanda McKinley	Sarah Tebbits			Wendie Schaeffer

Group Lead	Mary Baker	Robert Taylor	Amy Merten	Gary Shigenaka	Sarah Allan
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Recorder	David Clark	JD Ross	Elspeth Hilton	Hayley Pickus	Joe Inslee
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NWAB Workshop  
May 22, 2012  
Compiled by David Clark  
From breakout flipchart

### Breakout Session 1, Group A

Question 1: What are your specific concerns concerning planning and preparation for spill response?

- Knowledge about chemicals and effects of chemicals → decontamination
- USCG response time
  - o From Bethel, Anchorage, Kodiak
- Planning for potential damage to food supply
- Spilled oil from Chukchi will threaten Deering & Kotzebue
  - o “Wind funnel” from Chukchi will guide oil to Kotzebue Sound
- Oil movements
- Potential sabotage (a la Transalaskan Pipeline sabotage)
- Preserve food practices
  - o It’s fine to bring in food from outside to feed community in a crisis, but traditional food practices must endure
- Deering → marine birds
- Fear → people must believe in response & restoration → perception, trust
- USCG mechanical effectiveness?
- Oil fires? Flash points?
- Effects of oil on Krill/Plankton
  - o Indirect & direct effects on Beluga, Right Whale
- Effects on migratory fish → fish that cross village boundaries
  - o Fish that are owned by all villages
- Dog, Chum, Silver, Pink, Sheefish, Trout, Whitefish
- Local “concrete” infrastructure
  - o Containment
  - o Oil transfer worries, pipelines?
  - o Minimize damage
- Red Dog Port (July to October) → shared staging area?
- Village oil spill training → 1<sup>st</sup> responders
  - o Perhaps agency provided? Funded?
  - o Hazmat, Hazwopper
  - o Avoid another Valdez (where no locals knew how to conduct spill response)
  - o Provide USCG navigation assistance → “guides”
    - USCG doesn’t know their way around; no local familiarity
  - o Know who to contact
  - o Logistics
  - o Agencies must be locally familiar as well

- Must have local access to industry spill response plans
- Late drilling season accident
  - Force response into ice months
  - How??
- Local plan and agency plan coordination
- Specific village response plans
  - Coastal and inland villages included
- NRDA baselines?
- Create overall borough plan → Villages are interdependent!
  - Use as a template
  - Customize for each village
    - i.e. Kivalina hunts Bowhead more than others, so their plan would look to reflect this
- Kotzebue Sound → ice stays until July
- Ice arrives from North Slope
- Biological data availability?
- Basic oil effects on species
- Villages rely on the ocean
  - Chukchi Sea nutrition
  - Nutrient release
  - Lives are dependent on ice cycles
  - So, how do you restore the ice??
- Knowledge must be shared → federal, state, regional, village, individual
- Temperature concerns
  - -50 degrees, -20 degrees
  - Mechanical effectiveness
- Deering
  - 1899, 1901
  - Arose during the Gold Rush
  - Named from the sunken barge “Abby Deering”
  - Lives based on subsistence use
- Data trends over time
- Ice research facilities
  - Should be in Kotzebue, not Fairbanks!
  - Employment!
- TEK should be the focus of studies
  - Data exists, but it’s in a different form
  - TEK is usually treated as “anecdotal”
  - Simple interviews of local people are not enough
- North Slope Borough and NWAB collaboration is a must
- Herring (2 species) are affected by vessel traffic
- Seal Blight --> 2 out of 11 caught seals had to be thrown out bc of pollution
  - Fears are being confirmed

Question 2: What are your specific concerns concerning spill response implementation and management?

- Funding for training
  - o Money, manpower, equipment
- Decreasing resources
  - o Future resources?
  - o Where will it come from?
- Equipment and supplies are based in Seward → too far!
- Accountability for equipment
  - o Equipment dedicated to spill response
  - o Maintenance and mobility of equipment
  - o Appropriateness of equipment
- Designation of critical response sites → Airstrips, boat launches
- Concern about dispersant usage
- Concern about In Situ Burning
  - o Water column effects
  - o Air quality
- Concern about low mechanical recovery percentage
- Recovery of oil on shore → lagoon, tundra
- Time recovery issues
- Planning agreements → set up beforehand
- MOAs with tribes, borough

Question 3 combined with Question 5: Initial reactions to ERMA + What information would you like to see included in ERMA?

- Place name data → local names versus map names
- Other exploration efforts (i.e. oil, natural gas, mining, etc.)
  - o Exploration camp sites
  - o Airstrips, infrastructure, etc.
- International vessel traffic
  - o Ed Page with the Alaska Marine Exchange
- Boat landings
- TEK
- Standalone ERMA must be developed
  - o Due to internet connectivity issues
  - o Could be periodically updated
- People will use it
- Shelter locations, small boat routes, snow machine routes

Question 4: How could ERMA be useful for community involvement in spill response?

- Avoid media (i.e. have the same info as NOAA, responders)
  - o Communities do not have to rely on media for their accurate information
- Medical facilities, capabilities
- Local ERMA training (tutorials, factsheets, user guides, etc.)
- How do onsite people report to NOAA? (report on observations)
- Contact people (how to contact the appropriate authorities)

- Social media → facebook??

Question 6: What are “best practices” for community involvement in spill response, planning, and preparation?

- Funding for training
- Integration into existing village Search and Rescue network → Billy Lee
  - o “As needed”
  - o Provides continuity, manpower
  - o Reimbursement for response efforts
- Federal + Maniilug + Borough partnership
  - o State?
- MOAs
- Continuity through federal hiring cycles
- Kotzebue tech center → programs/classes
- ERMA training → important!
  - o Train more than 1 person → generational
  - o Hands-on training
  - o Mentoring; get young people involved
  - o Dialog within training
  - o Have a borough template for training
    - Customize for local village differences

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Compiled by David Clark  
From breakout flipchart

#### Breakout Session 2, Group A

Question 1: What effects of oil spills most concern you?

- Eidar (endangered)
- Every morning, Mr. Moto's calling loon
  - o Used to be 4 species
  - o Changing populations, distributions
- Damages to food → fears
- Recovery of populations
- Lack of baseline understanding
  - o Needed for NRDA compensation
- Broad impacts → \$ (resources to intervene)
- Cultural impacts → Language decline, challenge of revitalization
- Global climate change
  - o Acid rain → damage to plants
  - o High water, tides → Never used to be like that
  - o Effects on marine mammals
- How much oil will sink to the bottom?
- Not as many crabs as before
- Greenpeace in village → did not care
- Concerns about nuclear power
- Change to migratory paths
- Will communities be forced to follow changing migration → how far to travel to hunt??
  - o Price of gas → strain on community
  - o More risk of injury
  - o Strain on SAR
- 3 categories
  - o Technical
    - Response, \$, local engagement continued, training, subsistence mapping
  - o Biological
    - Oil persistence
    - Valdez
    - Human health? → cancer, diet
  - o Cultural
    - How do you value culture?
- Changing definition of subsistence
  - o Used to mean "survival", now means "culture"
  - o Technology
  - o Increasing needs
- Similar interests → politics

- Will resource restrictions occur in a spill?
  - o Less access allowed?
  - o Politics affects way of life
- Kivalina → household reliance resources is higher
  - o What if they couldn't catch the usual number?
- Coastal villages have an advantage
  - o Cascading effects on inland villages
  - o Even more difficult on inland communities
- Fish camps, watersheds, food chain

Question 2: Are there special habitats or specific areas you are most concerned about?

- Summer fish camps
- Spillover to caribou inland
- Shaman circle to "sing" to caribou → Do not disturb him!
- Bottom of ocean → Shell says "if you can't see it, it isn't there"
- Bottom trawl brings up contamination
- Dispersants on the bottom
- Walrus feed on the bottom
- No long term studies on dispersant effects
- Industry should have equipment on hand → clean up before it spreads
- Shallowing of rivers
  - o More animals coming down to the sea
  - o Faster snow melt → climate change
- Oil companies said to be careful
  - o Don't want lawsuits
- Ambler → intersection of rivers
  - o Used to be deep, bare
  - o Volume decreased, deposited sand
  - o Can't fish in the shallows
  - o Navigation → Can't travel in boats
- Lagoon systems
  - o Oil onshore
  - o Very productive
  - o Camp locations
- River deltas
- Salmon catches contaminated
  - o Smelled too much to eat
  - o St. Matthews Island
  - o Gov't took samples, never heard results
  - o A cover-up?
- Bearded seals with sores
  - o Can't use them
  - o Not in the local nature to waste anything, but forced to bury
  - o Spread sickness to people
- Wide variety of species will be affected

- Can we really rely on agencies for info? → Contamination info?
- News travels between villages faster than media
- Wrangell Is., Hanna Shoal, Barrow Canyon (Beluga travel route)
- Important to this area
  - o Movement of effects
  - o Migratory animals
- How to separate climate change effects from oil spill effects?
  - o Baseline information must be correct now; concrete
- Ice → seals pupping
  - o Oil under ice
- Bearded seal oil can sustain a family for a year
- Cumulative effects?
  - o How would spills change cumulative effects?
  - o Resiliency instead of “loss of services”
  - o Culture and “services” cannot be separated
- Tom Cod size is decreasing
- Flooding on tundra effects plant life → willow leaves

Question 3: What baseline information do you think we need to consider before a spill occurs?

- Use traditional knowledge as baseline
  - o River levels, timing
  - o Must be documented
  - o Use as a guide for research questions
- Cut strips of skin for rope
  - o Smaller seals → put into water until hair falls off
  - o Color seal skin → decorations, clothes
  - o Caribou hide
  - o Insoles made of grass
  - o Carve bones → never waste
- Perceptions will keep hunters from hunting
  - o Fear, how long to recover trust?
  - o Don't waste anything, don't want to expend effort
  - o Migration routes will change
- How to feed local spill responders?
- “Something going on” → fear is spreading
- Sheefish → Spawn in Kobuk headwaters
- Spill could wipe out specific species
  - o Food source, trading, connections between communities
- International effects?
  - o Enough to go around?
  - o International restrictions?
- Historically nomadic...not any longer
  - o Deering to Kobuk
  - o Need to move again?
- Gristle Soup from the caribou; helps heal, stops bleeding

- Movement to cities; others getting on the “compensation bandwagon”
- Moving baseline
- You are not alone
  - o How much knowledge sharing internationally?

Skipped Question 4

Question 5: What information would you like to see included in ERMA to support evaluation of effects?

- Oil tracking
  - o Bottom, ice, lagoons, river deltas
- Change in hunting grounds → also seasonal
  - o Travel in order to hunt
- Nova Mine
- Change in migration routes
- Preexisting contamination sites; proximity to salmon sites; mercury
- Cancer occurrences – 3 elders in the last 10 years
- Leave a better place for children, future generations
- Air plume from in situ burning
  - o Landing locations of particles
- Kivalina and Noatak have been dealing with mines for years → baseline
- Mercury in ocean fish
- Location of camps
- Seasonality of harvest
- Harvest areas
- Sharing/trading
- Travel routes
- “Search areas” as opposed to harvest areas
- Observations of elders → metadata
- Data protection

Question 6: Best practices for community involvement in evaluating effects?

- Continuing dialog
  - o Time series data from baselines
  - o Feedback
  - o Use of councils, existing social structures
- Team of village people in each village
  - o 1 person cannot relay TEK
- Elder’s Council, Language Commission, Subsistence Committee
- Existing regional conferences (NANA, borough)
- Marine Mammal Commission
  - o Outreach?
- 5 Advisory Committees; run by state Fish and Games
- Regional Council
- Area Advisory Committees
- Committee Sharing

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Compiled by David Clark  
From breakout flipchart

### Breakout Session 3, Group A

Question 1: Specific Concerns relative to restoration and recovery?

- Culture cannot be recovered
- Community will be here after oil companies leave
- Use existing resources (people, elders)
- Contamination of food sources affects sustainability of villages
- Funding for more information; more experience
  - o Lessons to be learned in the past; other situations
- Education → UAF, etc. (involve young people in research)
- Can you trust the industry biologists?
- Keep community involved with research; keep research local throughout the entire process
- Denial, anger, fault, frustration
  - o Create community problems (domestic violence, social impacts, etc.)
- Local involvement with communication process
- Industry only cares about \$
- The industry has the funding, we don't
  - o Match funding doesn't work, unfair
  - o "in kind" funding (employment)
- Longterm effects of restoration
  - o 40-50 years
  - o Unintended consequences
  - o How to sustain funding?
- Contractors for response?
  - o NANA, North Slope Borough?
  - o Provides quick response
  - o Local employees → increases amount of care for environment
  - o Outsider responders are nonchalant
- Low oil recovery rate
  - o 80% of oil will remain in environment
  - o Education, information, empowerment
- Release all information to the public
  - o Work with local groups
- How to channel anger into action?
- This culture has endured for thousands of years; what has made it so resilient?
- Natural migration away after spill
  - o Must keep the thinkers
  - o Include them in recovery process
  - o Maybe make it worth their while → \$

- Loss of artistic materials
  - o Walrus → Ivory
  - o Kivalina → Baleen
  - o Sealskin
- Culture camps

Question 2: Examples of habitat areas that could be improved?

- Oil on the bottom, beaches, ice
- Artificial walrus haulout floats
  - o Artificial habitats?
- Seaweed, Mussels
- Can you transplant?
  - o i.e. Muskox
  - o Seafood?
  - o Some you cannot (Herring, Whitefish)
- Creation of hatcheries?
  - o Dept. of Fish and Game?
  - o Locally run?
  - o History? Background?
- Challenges of arctic environment

Question 3: Are there other sources of contamination that could be controlled?

- Mercury, mining, dispersants, human waste, waste oil, bilge water, air emissions
- Ships, planes
- Celebration
  - o Walrus dance
  - o Teach children dances

Question 4: What traditional methods of restoration and recovery are practiced?

- Never had to deal with oil spills
- Traditional routes (snowmachines, boats)
- OUP has decreased
- Resources?
- Increasing costs of fuel after spill

Question 5: What could be done to sustain cultural and subsistence practices that might be affected by oil?

- Teach traditional celebrations
  - o Footraces, dances → whole communities involved
- Nikaitchuat → “language school” → immersion
  - o Each village has their own cultural camps
  - o School trips
  - o Community trips
    - Teach subsistence practices and survival techniques
- Support for Elders Council, Regional Elders Council
- Chukchi Campus → adult classes in netmaking, “Inupiaq Studies”

Question 6 skipped

Question 7: What information would you like to see included in ERMA to support restoration planning?

- Could ERMA be put into the school system?
  - o GIS training → computers
  - o Recommend future research

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From breakout flipchart

Breakout Session 4, Group A

Question 1: What data sets do not yet exist, but are needed?

- Place names (USGS & local)
- Other data sources
- There must be a place for incorporating outside information into ERMA
- Vegetation types
- Watershed information
- Intertidal zone mapping → Nearshore environment
- Substrate, aquatic vegetation
- Coastal management plans → “Appendix P”
- There must be a place in ERMA for reporting observations
- Crowley, Foss, Northwestern maritime travel routes
- Navy data? DoD? → They have info!
- Military satellites
- Integration with existing subsistence mapping village advisory committees
  - o Provide info, peer review

Questions 2 through 5 skipped

### Discussion of Oil Spill Response and Arctic ERMA

**Logistics of spill response, concerns, how local communities can most effectively participate, and how ERMA can help.**

**(1)What specific concerns do you have relative to planning and preparation for spill response?**

- Shungnak, Ambler hasn't had a barge in three seasons. Everything arrives by plane.
- Are there any other coastal villages that could take equipment and lighter it out. – Norvik, Selawik. Possible expansion of the runway in Norvik planned for the future. Kobuk, Kiana also has a good sized strip (but these are inland villages with possible river access in the spring/fall time, when the water is high).
- Where does the waste created by response go?
- If it has to go to Oregon for final burial, where does it get staged? How is the transport of the waste paid for?
- The lack of information in the community. Issues of response, community involvement being so unclear.
- How many people, airports, places to stay. Things that would be important to response. Lack of information about some natural resources. Information like where people hunt so that those places can be protected.
- If everything can't be protected, how are you going to choose what to protect?
- When thinking about PWS as a model (using commercial fish response), remember the boats here are much smaller. Less equipment onboard.
- Typical boat size here in 24-26 ft. 150 hp outboard. Most of them are using for set gill nets. Minimal machinery. Oil response would have to be done by hand.
- Difficult to compare PWS response to Kotzebue response.
- Challenges involved in maintaining large caches of response equipment.
- Concerns about how well maintained the booming equipment is. The current set up locally is for diesel spills. Not for crude oil. Maybe intermediate oils.
- Local resources may be able to respond for up to 3 days.
- What about Bering Sea crab fishery? They wouldn't be around in the summer.
- What kind of containment exists within the Shell plan and the Shell vessels. Could these vessels get into this area? What are the drafts involved?
- Local inventory of vessels that could be able to respond.
- Concerned that community members should be involved in planning. Community should be involved in the discussion of prioritization. Involved in identifying what is ecologically important. In fact, if communities aren't involved its most likely that prioritization will not be accurate. The wrong resources will be protected.
- One notion is to protect life first.
- Has the geographic response planning been done in these communities? Have local people been involved in this?
- With respect to planning and preparation, the nearest ports are in Unalaska and St Paul. And if we really talk about the nearest port, Red Dog port is actually closest.
- Who is in charge of spill response? What is the coast guard doing to try to increase capacity?

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-Are trade schools involved in increasing capacity in spill response? A lack of educational opportunities to teach people about spill response in the area. If we train arctic people, they can use their knowledge and be better responders.

-How can we learn from other areas in the state. This will help us incorporate what they've learned.

-Learning from other areas is good, but things are different here. Drills in the area would be important and helpful.

-In PWS, spill responders come from the fishing fleet. They are trained yearly. The boats are larger there.

-Alaska Clean Seas has village response teams. They do local training of village residents.

-It appears like the Kotzebue area has been left out of community involvement in spill response. Further north and further south, these efforts exist, but not here. Maybe there are lessons from those efforts that can help here.

-Lack of shoreline protection limits the usage of the red dog mine port. 1.5 hours between airport and red dog. 15 ft draft. Very sensitive to weather. The airport is also hampered by fog and crosswinds. This is the deepest port in the area. They've waited a week for nice enough weather to bring in a barge.

-Might be faster to fly equipment into Kotzebue, lighter it out from Kotzebue instead of going via Red Dog.

-Which agencies will be involved in administering the response? After the plan is conceived, who will be responsible for taking action?

-If we could enhance the economic development in order to have local response, communicate better, have better knowledge about what type/effectiveness of the equipment that will be used.

-Since unemployment will occur due to spills, maybe we could have permanent positions now that could prepare in advance.

-Establish a liaison between community and NOAA. Planning is good, and requires communication. Communication breaks down. And misinformation can have a very bad impact.

-Economic concerns – address these by bringing in local people to formulate plans/be involved from the beginning.

-Create jobs, and opportunity for younger children to look forward to job opportunities.

-Create jobs that are filled by people living in the area.

-People come from lower 48, have good intentions, but sometimes has a negative effect.

### **(2)What specific concerns do you have relative to spill response implementation and management?**

-If oil companies have all the equipment, it seems there is a lack of communication between the oil company and the communities. If they have all the equipment, don't they need to be in contact to be able to fly that equipment to shore?

-The drilling has a C-Plan, but shipping doesn't have that same requirement. What about shipping? Who has planned to respond to something like this? Can other equipment be used?

-There is a need for scenario planning. We did one scenario for the last ERA, but maybe each community needs a scenario to help them develop their own strategy for who to call, what should happen in the event of a spill.

-What type of scenarios were used when developing the GRPs. It was more about what do you want to protect, less about the source of the spill. Most valuable areas – prioritizing some places.

-Most places don't test the strategies established by the GRPs. PWS does, but they are very lucky to do that. Its always good to test your plans.

-Shell should fund scenario planning in each community. Who would be the players involved, who will be called, what would be the steps that would be taken. A tabletop exercise for each community. Practice taking the steps that a community would take in the event of a spill.

-Have any local communities been involved in ICS training or drills? The city requires certain people, fire commander to take ICS courses. Firefighters use this system, and the local government is involved in its use. It has been set up in the past.

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-Is there a public health plan that corresponds to a spill? Current plan is regarding where people should go.

-There are people who have experience fighting fire, using ICS, responding to oil spills. There are trained crew bosses (Alaska firefighting), perhaps they could be cross-trained for spill response. These folks have a lot of experience working in tough conditions. Tent living, sea rations, experienced and adaptable. Norvik has done a lot of firefighting.

-There are currently a lot of small spills, if there was a local response, it could be faster, more efficient. Crews need the training to be able to do this.

-Most village people oppose drilling out here because there is no communication. People aren't aware of these types of meetings. The infrastructure up here is a lot different than in the lower 48 and this affects communication too.

-Lack of information about who can be called when there is a spill. Who gets called first?

-Who is the go to guy, the first organization that gets called in a spill?

-Community people need to know, at a very local level, who should they go to first. This really needs to be public knowledge. It should be really clear what the steps are. Getting from person who sees the spill, to starting the official response.

-If fire/police are the first official call, they must be well trained so that they know who to call after that.

-The coast guard seems like a large, confusing organization. The local government seems prepared to respond to something small.

-It's likely that as it is, police/fire are first responders.

-Providing basic knowledge to people about how to respond to a spill.

-No detailed oil spill training at the hospital. It would be helpful to provide training at hospital to help people involved in oil spill response.

-Booming might not be that effective up here.

-Need to do studies on where ice is involved, and the possibility of non-booming tech. Things like soaps and bacterias.

-Planktons and fish that are migratory are important. This is important for inland communities also. Birds are migratory too. Worried about the possibility of Bird Flu. Migration to other countries due to the migration of birds or other animals. Widespread consequences.

-Almost all the animals are migratory. They come with the seasons. Migration has a large effect on the way of living here. The routes of these animals are important. Not just the location of a spill.

-Contaminants in the food chain really affects everything.

-There are people who have Hazmat training who are involved in fuel tanks. This may be a place where lists currently exist.

-Local people need certain types of foods. And these subsistence foods are embedded and are required for good health.

### **(3)What are your initial reactions to the Arctic ERMA Prototype?**

-How would a stand-alone version of ERMA work?

-It's important to remember who the audience for ERMA is. To bring the local community to the tool, perhaps use it for more than just oil spills. People need time to learn how to use it.

-Bringing LEO data into ERMA. These are local observations that could be brought into the map through a decentralized process. Can put people in contact with one another.

-Coastal and marine spatial mapping is an existing tool, and ERMA should be aligned with it. Human uses of the environment. Alaska doesn't have a CMP, but ERMA could aid this.

-Coordinate efforts. If you are going there in your sled, why don't we go there together, in the same sled. There are already tools that do mapping. To make this meaningful, collaboration and combination is required.

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### **(4)How could the tool be useful for community involvement in spill response?**

-Maybe local people could be involved, in the spill event, with guiding the response effort.

-Feeding, housing, waste management of a response effort is a challenge.

### **(5)What information would you like to see included in the tool to support response decisions?**

-Trajectory modeling. Where could oil go? How long till it gets there? How long does a given community have to respond?

-Agencies need to know the manpower, local equipment available.

-Examples of this are Crowley, ADEC. Spill response equipment.

-A list of trained people. From all the different communities.

-This may be available through the NWAB. This may be data that is a legacy from Y2K preparation. Some of this might look like generator availability.

-Red Dog Mine has some lists of what is available.

### **(6)What are best practices for community involvement in spill response, planning, and preparation?**

-Need to know what the best technology is. Used to use diapers or paper towels. Now there are new technologies like soaps and bacterias, and there needs to be evaluation of their possibly effectiveness up here.

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#### Initial Summary:

-Setting up local response with people who have important experience (e.g. emergency firefighters) but are additionally trained. These should be permanent, paid positions, held by local residents. Using local technical training resources to train people.

-Improving the community understanding of who should be called first in the event of a spill. This could be done through scenario planning or tabletop exercises.

-Using experience from other areas to improve community involvement in response here. Prince William Sound and North Slope with Alaska Clean Seas for example. However, remembering that there are a lot of differences here, for example fishing boats are much smaller here than in Prince William Sound.

-Better understanding of what resources for response currently exist in the local area. Trained people, boats, facilities like Red Dog.

-ERMA should be coordinated with other efforts.

-Oil spill trajectory information would be helpful. Communities could benefit from knowing how long it might take oil to arrive. . How will resources be deployed to protect critical sites.

-The importance of food security. Local people rely on and require specific foods to be healthy and those can easily be damaged. Migratory animals mean that a spill can effect the health of a wide area and many communities.

## **Discussion of NRDA, Restoration, and Recovery**

Logistics of NRDA, concerns, how local/871 communities can most effectively participate, and how ERMA can help

### **(1)What effects of oil spills most concern you (for example, health and use of natural resources)?**

Marine mammals, Birds, Fish, Crab or other shellfish, Land mammals, Other cultural concerns (for example, education, language, arts).

-Most of the seal oil comes from Ugruk and this is very important for vitamins. This where the communities vitamins come from. Their blood is very dark and has a lot of elements in it. Vitamins come from sea mammals in general. This is what keeps people healthy – avoids scurvy and gets vitamin D during periods of no sunlight.

-Vitamins also come from fish oil. Trout, Herring, Smelt. The animals with oil in them usually come from the sea.

-There is springtime eggng for birds. Seagull eggs down on the beach.

-Buckland and Deering do Muir eggng on Shamisho island.

-Buckland does smelting. Below norovik they do smelting.

-There are lot of scavengers, animals that just scavenge. Foxes, blue and red, that live mostly from scavenging. These animals may consume foods that are contaminate and spread this through excretions like feces and pee to the plant chain and can be transported to caribou.

-Salmon, which are migratory, are very important.

-Microorganisms. And movement of sickness through the food chain. The animals are also migratory.

-Plankton is important.

-An important question is why do these migratory animals come here. How could that be changed by an oil spill.

-Whitefish. When migratory fish go through the area, it affects other fish in the area.

-We need to understand the type of food that goes through the food chain in order to be able to understand how it would be effected by oil spills.

-Permafrost is melting.

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-Most of the whale species eat microorganisms. Especially when oil comes from the seafloor, in a plume, it can be harder to contain and it effects the prey of important animals like Ugruk (bearded seal).

-We need studies on red tides and plankton tides. These are natural processes, but its hard to distinguish when this is natural or when it might be the result of the oil activity or oil spill.

-Once the mammals or animals consume the contaminants – you don't have to consume the animal to be effected. There are other pathways – coming into contact with the animal or its excretions and become sick.

-The health of the food web and the health of the microorganisms would be important, a good indicator.

-Effects of a spill affect microorganisms first, and then the effects move up the food chain.

-Birds also live on the ocean and come to the land areas to lay eggs and raise you. But during the winter they are out in the ocean.

-Eiders winter out in the Bering Sea.

-Sickly animals are not taken in the hunt. For example, there are sores that are showing up on some fish. This may be natural, due to mircroorganisms, but could be from humans too.

-Microorganisms regulates all species. Including how plants can grow as well. They can break down the soil and make it possible for different plants and trees to grow.

-Animals are sensitive not only to changes in what they eat. They can also be effected by noise and congestion.

-Beluga whale are harvested by Kotzebue people every year in the spring and summer. Buckland and Deering and Kivalina also hunt beluga.

-Kivalina hunts Bowhead also.

-Fall harvest is mostly for seals.

-Beluga hunt happens whenever beluga are around.

-The culture is to show respect for the animals. This encourages the animals to return. For example, when caribou migrate, they follow the scent trail and footprints of previous/lead caribou. If that trail is broken, disturbed, or if the lead animals change their route, the whole migration can change.

-If weakness or sickness is noted in a species, like fish with sores, we notice that and try to use a different species.

-Food undergoes a lot of complex processes in order to prepare it for consumption. These are connected to the way of life and to hunting. This can relate to a change in the seasons and the length of the season, and how that might not only affect hunting success, but the challenges that are involved in preparing the food.

-Its important to ask questions not only about hunting success, but also success of processing.

-After a spill, people would become a lot more sensitive to the condition of animals that they take. Check the animal for abnormality before eating it. Sometimes outside tests can be used, but those aren't always available. In other words, animals would still be harvested and then after catching them, they would be evaluated for abnormality.

-What if a given animal was so affected that its population was too low to harvest. Fish and game already shares information about catch levels, so fish and game would probably be looked to for help determining a safe catch number.

-Licenses are controlled by Fish and Game and we share a lot of information with them. Surveys are completed by hunters and shared with Fish and Game. Fish and Game helps with the scientific work and evaluating the appropriate take levels.

-Hunters also talk to one another to see how the health and numbers of animals are. And this information would be used to determine whether hunting continues to be a good idea.

-The ice seal committee, the co-management committees could also provide information on safe harvest levels after a spill.

-What about human health concerns. Whether they consume polluted water, fish or salmon. What could affect humans in a spill situation. There needs to be a baseline human health survey.

-Bird flu is an example of how important migratory birds are, and their ability to spread contamination. This also relates to how to deal with possible contamination and how people have responded in the past. With bird flu, people were advised by fish and game to cook birds longer. Instead of completely stopping consumption, there are ways to adapt consumption.

-Before oil activity, there needs to be long term studies (long term in order to include migratory aspects) to determine causes of animals sickness. Whether sickness is caused by natural causes, and to determine natural cycles.

-If subsistence hunting was damaged, sharing of the hunt with elders would be disrupted also.

-If hunting was disrupted exercise would also be limited.

-If the ugruk hunt was disturbed, more pressure would be put on other resources like caribou.

-The traditional practices are based on something that happened before. They are habits that are based on a oral tradition.

**(2) Are there special habitats or specific areas that you are most concerned about? (for example, sensitive areas, historical sites, camp areas)**

- Ringed seals calve over by Buckland in the springtime. And they calve on the ice there.
- When you look in ugruk stomach, you find shrimp and crab. Ugruk feed off bottom and the shrimp eat something.
- Traditional knowledge of benthic species would come from knowledge of what the stomach's of bearded seals contain.
- What the bearded seals are eating can also be assessed by looking at the surface of the ice and finding crab shells.
- The timing of bearded seal feeding. They feed on the bottom at night, but during the heat of the day they rest on the ice.  
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- Before they do anything, it would be better if we could know how things occur naturally. Nature has its own animal control. Things have a natural flux. These must be studied. For example, there was a massive starvation in the 1800s. Lots of local people migrated to find more food. Something natural must have happened to cause this. Preliminary studies could identify each animal, not only their habitat, but also what they eat.
- If prey is affected, ugruk may initially appear healthy, but could get sick later, or simple move to another area.
- There is a lot of mercury that came from gold mining. This has moved up the food chain.
- Bearded seal hunted in the springtime for sea oil. Also the smaller seals (spotted and ring) are hunted in the fall as well. There are existing tracking and migration patterns done for bearded seal, done by the Kotzebue IRA. This was done with Peter Boveng.
- Terminology locally: Ugruk refers to bearded seal while 'seal' usually refers to spotted and ring.

**(3) Given the changing Arctic environment, what background/baseline information do you think we need to consider about the health of the environment before a spill occurs?**

- Subsistence mapping is occurring and is important.
- How many households/homes are entirely dependant on subsistence. If a spill disrupts the resources, what would these households be able to do?
- The younger people who do subsistence hunting give a portion of their catch to elders. The food is processed first.
- Subsistence mapping, identifying all the areas and what time of year they are being used is really important. Everything is migratory other than whitefish, rabbits...).
- Animals are hunted when their meat is prime and when they are healthy. This is an important

aspect of choosing when to hunt.

-The Kotzebue IRA has information on when and where hunting takes place.

-Subsistence research/surveys. These were done for Red Dog mine. Steve Braund. (SR Braund and associates). These could be important baseline information. Kivalina, Noatak, Kotzebue. They go back as far as 10 years. Generally not publicized, but are on the red dog SES website.

-Its really important to understand what can be learned from existing semi-directed interviews. You may want to employ a traditional knowledge holder to review interview information.

-There are data about catch effort, fecundity, and other indirect measures that could be used to extrapolate populations.

-There are some plants that have been monitored for some time due to their rarity.

-Some seal tagging has been done. John Goodwin was involved in this, and also work has been done on clam.

-Ocean acidification has also been completed.

-Subsistence harvest studies done by Alaska fish and game. These are done for each village and are broken down to the per person level. How many pounds of a given animal is consumed per person. This is not available for every community. They do exist for Kivalina, Noatak, Selawik, Kotzebue, maybe Deering. These also include plants, in addition to salmon, beluga.

-What portion of the community is involved in hunting?

-Social community studies – how much teaching goes on, that is, if there is less hunting there would be less teaching of young people how to hunt. Other social activities.

-Do studies to determine what effects will the oil have on the habitat?

#### **(4)How could the ERMA tool be useful for evaluating effects of spills?**

-ERMA could show changes in energy transfer. Introduction of parasites or new diseases and how ERMA could show these pathways. Inform people where in the foodweb things are being most affected if they could see the pathways.

-Combine knowledge of energy pathways with disease information and show how indirect effects of a spill are spreading.

#### **(5)What information would you like to see included in the tool to support evaluation of effects?**

#### **(6)What are best practices for community involvement in evaluating effects?**

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-Subsistence harvest studies done by Alaska fish and game. These are done for each village and are broken down to the per person level. How many pounds of a given animal is consumed per person. This is not available for every community. They do exist for Kivalina, Noatak, Selawik, Kotzebue, maybe Deering. These also include plants, in addition to salmon, beluga.

-What portion of the community is involved in hunting?

-Social community studies – how much teaching goes on, that is, if there is less hunting there would be less teaching of young people how to hunt. Other social activities.

-Do studies to determine what effects will the oil have on the habitat?

#### **(4)How could the ERMA tool be useful for evaluating effects of spills?**

-ERMA could show changes in energy transfer. Introduction of parasites or new diseases and how ERMA could show these pathways. Inform people where in the foodweb things are being most affected if they could see the pathways.

-Combine knowledge of energy pathways with disease information and show how indirect effects of a spill are spreading.

#### **(5)What information would you like to see included in the tool to support evaluation of effects?**

#### **(6)What are best practices for community involvement in evaluating effects?**

## **Breakout Session I: Discussion of Oil Spill Response and Arctic ERMA**

Theme: Logistics of spill response, concerns, how local communities can most effectively participate, and how ERMA can help.

### **1) What specific concerns do you have relative to planning and preparation for spill response?**

- Federal agencies are putting together a lot of various plans for spill response, concerned about involvement with private landowners. Private lands are located at mouths of rivers and in lowlands and want to make sure response teams are specifically inviting landowners. Native allotment owners do not have the capacity (financial or physical) to respond. These private landowners need to be reached out to, especially when exploration starts, so that information is current.
- Specific concerns about how spill response will be sensitive to food security – want to know when it is safe to consume greens from lowlands, fish, etc. If oil gets in lowlands it will prevent greens from growing back, which is a major problem. Making sure oil doesn't reach lowlands and into soil is important to protect the greens.
- Outreach is wrong when meetings are in Anchorage. Today is the best step yet, coming to Kotzebue. Generations have known how to get to Kotzebue using currents, local information, etc. The locals are who know the most important information, and that needs to be incorporated into the spill response. Traditional knowledge of currents is the most important information you can gather.
- **Biggest takeaways:** Concern about delay, would really like to be able to jump into action right away to prevent oil from entering lowlands and areas that cannot re-grow, areas that will have permanent damage. Because locals have best knowledge of currents, being told where spills are and when, even if it may not seem to impact the community directly, will allow them to respond appropriately based on their knowledge.

### **2) What specific concerns do you have relative to spill response implementation and management?**

- "There's nothing here". Spill response is far away and takes days to get here. Equipment needs to be here. Location and timing are biggest concerns. Villages have to have some equipment to keep from going into rivers. Being able to block the oil right away while they wait for USCG response is key. Training for response and having local response teams ready. Hard to predict when a spill will happen, and when it does it moves fast – locals know the currents and are right here, need to respond right away to prevent oil from going inland. Roots and willows will die and won't grow back – no second growth. Erosion is another big concern.
- Having a group of people go to each village or have a team from each village come to

- a training would be good to make sure each village is prepared to respond.
- Any delay to response would be very damaging. Making sure people all know about a spill right away so response can be set into action right away.
- Go to villages when they are having an IRA or city council meeting – great time to talk to a lot of people.
- Forms of communication that are well received: meetings and radio. Depending on online communications is not appropriate, misses elders and other groups. Facebook will work for letting younger generations know and that will be spread throughout the community. Facebook is at least a good start. Anything to allow the locals to prepare.
- Timing of year is critical – making sure response is planned for each different season.
- Communication system is being developed to spread information throughout NW borough. When fishing – weather radio is listened to regularly. CB radios are also a good source of spreading information.
- Mechanism to integrate local governments into the industry's incident command center would be helpful.
- Don't want to just sit and wait for command center to arrive and set into action – want to be able to put response into action right away.
- **Biggest Takeaways:** Communicate with locals quickly and give them the tools to respond right away until a bigger response team can arrive. Incorporating local knowledge is critical, and making sure locals are involved will make sure that the right knowledge is incorporated. Making sure a group of folks from EACH village are prepared and contacted is also very important.

### 3) What are your initial reactions to the Arctic ERMA Prototype?

- "We'll give it a chance to work" – seems helpful.
- Source of data and year of data collection is helpful for reference.
- Doesn't include maps of movement of locals and how/where/when they travel, to make sure the area is avoided.
- Making sure name of rivers is helpful for use during search and rescue.
- Seems like a good approach, but concern about national waters – what are Russians, Chinese, etc doing in Arctic waters, multi-national corporate investments – how do we get everyone on the same page? For circumpolar arctic community, need to incorporate all the information to provide best circumstances.
- Normally don't want to share where spots are so people don't dig around in them, if you can get the same information from park service that would be good.
- **Biggest Takeaways:** Good start but needs to incorporate more use patterns and more about international actions.

#### **4) How could the tool be useful for community involvement in spill response?**

- Whatever information ERMA has could be used for response and could be used locally as a planning tool.
- Making sure local communities have access to data layers about where oil is and projections of where it is headed.
- Maps of where response techniques are used and what response technique was used (and where it will impact) would be helpful for local planning.
- Past exploration, activities might be year round. Knowing what type of year round activities might be undertaken will be important to know for response planning purposes.
- Outside agency plans for response should be shared with local communities. Communities should be highly involved in the planning itself.
  
- **Biggest Takeaways:** Providing locals information about current response actions so that they can interpret for themselves what is at risk and where they should protect/avoid/whatever it may be. Knowing where things are happening to prepare for where a spill or incident may occur is a part of this as well.

#### **5) What information would you like to see included in the tool to support response decisions?**

- See above!

#### **6) What are best practices for community involvement in spill response, planning, and preparation?**

- Doing the clean up instead of bringing people in to do it.
- Being prepared with tools, training and the right contacts to set response into action right away.
- If spill is still occurring, even if far from shore, community needs to know to be prepared.
- Inventory of what community has – boats (size, capacity, ability, quantity). Contact information for folks who have the largest boats that can help with response.
  
- **Biggest takeaways:** Keeping things as local as possible for response helps (allowing locals to be involved, even in charge) and in doing so having an inventory of what the community has for equipment will help. Making sure community is in the loop no matter what the assumptions are about the path of oil or impacts is key.

## **What questions should we be asking? What else is on your mind?**

- Resource questions – sea mammals (migration times, where they are summering, how much do locals get, what tagging is being done and on what age mammals). There are a lot of community questions about the disease/abnormalities impacted seals. Community would like more information about the health of the sea mammals.
- Locals have all the information about what thickness of ice prompts migration, different speeds of currents and locations of changes in current. Currents are different in different levels of water – where are the currents being measured? Are they fully accurate? Locals know where water comes from based on appearance, these are things NOAA might not/does not know.
- Walrus, beluga, bowheads.
- NOAA will never have a complete, accurate survey of all of the animals – what you see on top is completely different from what doesn't show up. That's why natives question decisions by agencies because they feel information used to make them is inaccurate.
- More complete inventory of the resources in the area (birds, mammals, etc) is really important, but getting it for fish will be difficult – natives know what's out there though and can share that information.
- If equipment is brought out here, make sure it is sound – it will be able to do its job and will last a long time. Scary that old or faulty equipment could be brought up here. Need to bring extra parts that won't be available here if something breaks.
- Assumption is that we're responding to a spill, but other things create disturbances to marine wildlife. If a ship breaks down, can cause harm and may not be fully being looked at currently. Is there more than just oil and chemical spills that ERMA can address?
- Noise levels used by industry that are harmful to marine mammals – is this incorporated into ERMA? If not, should be.
- Conoco Phillips is working with the North Slope Borough and trying to record shoreline sightings and information about dead/injured marine life or signs of such.
- **Is there going to be a survey of villagers? Would really like it if these questions were asked of everyone and many will respond.**

## **Breakout Session II: Discussion of NRDA, Restoration, and Recovery**

Theme: Logistics of NRDA, concerns, how local communities can most effectively participate, and how ERMA can help

### **1) What effects of oil spills most concern you (for example, health and use of natural resources)?**

- **Marine mammals**
  - **Birds**
  - **Fish**
  - **Crab or other shellfish**
  - **Land mammals**
  - **Other cultural concerns (for example, education, language, arts)**
- 
- In the fall the ice gets thicker, and when that happens we won't be able to see the spill – then how do we measure it?
  - As the ice breaks up and the leads are open (in Kotzebue Sound) – belugas head north first, then bowhead whales. Migratory patterns are very important. There are resident ring seals, but the rest (bearded, spotted) are migratory. Females are the ones that stay, and they are hunted in the winter. Weather is the key factor in migratory movement (?).
  - Hard to know what the currents are in the winter time when there is ice on top. Oil company is collecting lots of information and sharing it, but it is only for the areas around the drilling, not where impact might be if there is a spill.
  - Birds – impact on birds will be in the lagoons and lowlands where they breed.
  - Land mammals – impact will depend on where they are – if oil spill gets into areas where the caribou feed and migrate along the coast or in the fall when they cross the lowlands. If there are impacts in the lowlands, the impact will be on their food supply. The caribou will also go onto the ice to avoid mosquitoes and to get salt from the ocean and ice, before they start their migration south. The caribou will smell the oil and avoid it. They have followed the same migration path for thousands of years. Oil would change their migratory patterns on the lowlands.
  - Moose first appeared herein the 40's, they are seen all around the region, hang around the villages.
  - Musk-ox are nuisances, were reintroduced in the 60's. They stomp dogs, stomp on berries and greens.
  - Fish – seal oil has an effect on fish. Concerned about the resident fish in the lagoons – those have the potential to be wiped out along the coast. Concerns include local and migratory fish.
  - Crabs are collected on the shore for subsistence – not enough quantities for commercial.
  - Walrus – airborne exposure and through the crabs they eat. If there is a spill in the Chukchi, the winds will push them to the shores of Point Lay. Belugas have been there for thousands of years. Walrus are running out of ice and coming ashore – they will be exposed. If oil residue gets stuck on their whiskers, which are sensory mechanisms, that essentially partially blinds it – it will have trouble feeding as well.
  - Land otters and beavers in the lowlands and eat fish.

**2) Are there special habitats or specific areas that you are most concerned about? (for example, sensitive areas, historical sites, camp areas)**

- All the lagoons and lowlands along the coast.
- Small tide along this area there are some areas that have a 6 foot tide. The NPS is cataloging lagoons along the coast. Those would be useful to have. There are many birds the reproduce in the lagoons, and are important to people in the area. All the grasses will die and it will cause more erosion.
- Erosion is a problem along the coast.
- Barrier islands that are small islands and they have lagoons and a lot of nesting birds. The islands are disappearing. These lagoons are critical to the migrating species. Nobody lives on the islands but animals do – seals, marine mammals, (this is all up north). Here there are no barrier islands along the coast, but there are lowlands in the Cape Espenburg. area. Outer shoreline is gradual. Coastal management plan map shows special areas that are critical.
- Hunting areas are most important.

**3) Given the changing Arctic environment, what background/baseline information do you think we need to consider about the health of the environment before a spill occurs?**

- Oil will accelerate the changes we are seeing. Erosion has caused the loss of 30 feet in the last x? years. Caribou migrate when it gets colder, so when it keeps getting warmer they will migrate later and later.
- Tired of telling the same story over and over and seeing no action go into place.
- More snowfall, more river erosion, sea levels are higher, storms are stronger. When things test the animals, they move to survive.
- Hard here because of the ice – hard to say what things look like while there is ice.
- 

**4) How could the ERMA tool be useful for evaluating effects of spills?**

- Making sure you can match the potential for spills with where the priority habitat areas are.
- Knowing the path of barges and vessel traffic and what critical areas it goes by.
- Proprietary information is critical – perhaps could be protected unless there is a spill. Shouldn't be blocked when it is impacting a common resource.
- Knowledge has all been learned from elders and from doing it himself and now we are asking for them to just give it to us.

**5) What information would you like to see included in the tool to support evaluation of effects?**

## **6) What are best practices for community involvement in evaluating effects?**

- Person to person conversations.
- Talk to IRA and city councils to ask if it is okay to come in and ask questions, then if given permission it is fine.
  
- Need to keep going out and communicating – can't just ask once. Go to each village on an ongoing basis, just one meeting is not enough.
  
- People are finally here talking about the impacts, even though the leases have been signed. More people should be able to listen about what is being discussed. A continuous line of communication is necessary, before we go to court.
  
- Don't appreciate effort to put a value on resources.
  
- How do you put preemptive value or potential damage on our life? You put it in that form to an oil company – how do you put aside money from those explorers to where there is a fund that could compensate the people, in anticipation of restoration.
  
- Who is giving the permission to the leases? Why aren't the getting permission from the people who live here? Who live in the areas that will be impacted by the oil? It affects their lives and they need to start asking for permission from those communities.
  
- Money won't help find more seals or fix what got damaged – not everything will be fixed.
  
- Glad we are here asking questions. Out of the seven days of the week – five are subsistence. A gallon of milk and a dozen eggs are very expensive – people are struggling to get by as it is and if they lose the subsistence resource they will have a very hard time. Gas and oil prices are going up and food is very expensive. The loss of subsistence will be devastating to the local communities. The fact that locals have to have permits for hunting and fishing and restrict the land, and then can come cause harm without permission.
  
- Local oil spill response with local resources to respond would be really good – it is a big void right now that there are no resources to respond.
  
- It would be good if people came and trained every so often, to all the villages, to train them and keep them in the loop and prepare them for what may happen.
  
- We're in a cash economy – who will put up the money for the training costs? For anticipating a response? In a perfect world that would be happening right now, in the reality, if a local is out there and sees a spill, they will and want to respond. What about the unintended consequences.
  
- There is funding for firefighting, why can't that be done here for spill response training and

equipment?

- If there is an oil spill we will respond in mass, and will want people to come help too. Will respond to help their people, but need to be supported to make sure they are getting food, okay with their job, etc.

- Should build up expertise here and outside so people can come help as well. Local emergency model might be a good one to use for spill response model. Already a process for training and planning.

- Lots of training like CPR that was done before AmeriCorp group went out and helped others. Were prepared.

- Planning for emergency services (LEPC), (public safety, fire) three people on staff - lots of people who volunteer for it and also help around the state. Run through the borough – training and planning done and could be done for spill response as well.

- In addition to people, infrastructure, tech and equipment needed to respond. If there is no infrastructure, how well can people respond even if they want to? Regulators can become partners in making that happen. Village needs to be able to trust regulators.

- Shipping traffic is a concern too, not just the drilling. There are a lot of barges around the area – bringing fuel and oil to the villages. A lot of Russian shipping happens as well – safety concerns.

- Depends on which village you are in whether it is better to talk to individuals or the city or tribe. Regional agencies work closely with the villages and can share which ones will prefer which approach. Economic Development Committee (within NANA) goes around and talks with a lot of the tribes.

### **Small Group Breakout Session III: Discussion of NRDA, Restoration, and Recovery**

Theme: Exploring restoration options and how ERMA can help

#### **1) What specific concerns do you have relative to restoration and recovery?**

- How do you restore a lowland area where the grass has been destroyed, can't grow any more, and causes erosion? No way you can restore those.
- Replanting won't work.
- The marshes in LA were eroded right away – how do you restore something like the breeding areas in lagoons?
- Want the experts in dealing with habitat restoration to be here, to be talking to the community.
- No chance of stopping erosion.
- Impossible to collect baseline data when everything is changing – new sinkholes, rivers, lagoons are changing.
- In the early 70's poles were put in the shoreline that are now in the ocean – can provide data about what has changed.
- When erosion happened, villagers had to move further back.
- Hard to give answers because locals have never experienced it. All they know is what Shell is putting in their plans. Are there entities to have the tribes involved in that? In the policy making of the recommendations?
- Local response vessels would make such a big difference. Locals won't wait, they are going to take their boats out and respond, so they need to be trained and equipped to make it more effective.
- There seems to be no unified group in charge of response, locals should be in charge, not the Coast Guard that doesn't know the currents, the winds and all of the other important information.
- Would be good to do a comparison with other off shore drilling countries – what are they doing for restoration? Problem is it always shows people on calm shorelines doing restoration – that won't and can't happen here. The weather is crazy and will be hard to work with.
- Drilling on shore is so much easier to respond to, if it's onshore, huge risk in drilling off shore because of all of the unknown's. No benefit for the people who are taking the biggest risk.
- People that live here should be the ones representing themselves – in Congress, in the oil companies, and so on.

#### **2) Are there examples of habitat areas that could be improved?**

- Putting the Chukchi Sea into 'national treasure' designation would protect the sea and the people that live here.
- Spur lines and the ships that will take the oil down – how can the area benefit and take advantage of these events? Can the infrastructure be put in to help the region benefit, such as a refinery so that oil isn't \$10, \$15 a gallon?
- 

#### **3) Are there other sources of contamination that could be controlled?**

-

#### **4) What traditional methods of restoration and recovery are practiced?**

- Allow locals to have the rights to their own lands.

#### **5) What could be done to sustain cultural and subsistence practices that might be affected by oil?**

- Partner and network with local projects to sustain culture – mostly financial. More language immersion

schools. Enhanced training in mill right program to train people in tech jobs. Chukchi College needs more resources – have really successful programs. Need more programs to help train people for the jobs that are available. Needs to happen here.

- It is a very spiritual connection – no dollar amount that will repair that. The land and the resources give back to the villagers. Make sure the industry understands that it is not about money, it's about how the villagers take care of the resource and how it gives back to them. This is how they have sustained life for generations. When you abuse a resource it doesn't give back.
- What was traditional knowledge 5 years ago is not anymore because of the acceleration of climate change.
- When there is policy making decisions about the arctic, representatives of the arctic need to be there.
- Funding always goes to communities with larger populations. Easy for agencies to say 'you don't get money because there aren't enough people'. Ensuring small communities still get dollars is really important.
- Student science fairs that allow kids to come up with great ideas and encouraging those will help with creating good ideas from the community. These already happen, helping them happen more often and providing support would be really helpful.
- Because it's the food we're talking about, if that changes it won't be the same. The cost of living is extremely high and it's all very frustrating.
- The biggest thing we could do is give a voice to the locals, change the law. It's not okay to hear 'you can't stop them' – we've been here for thousands of years and we will be here after.
- NOAA has a good reputation but could be better. Be more involved, not be just a website. Offices are somewhere else, but they should be here and people within the agency should fully understand the issues.
- The people that issued the permits need to be here, need to come to the community and ask the questions. Locals can't afford to go to DC and lobby, but oil companies can. The communities are out of sight and out of mind, and aren't being fully considered.
- There are so many people that can't afford to eat other food if they can't eat subsistence.
- Oil is too expensive and is so important, price of living needs to be lowered.
- All these people come to Alaska and natives don't know who they are or what they are doing, they need to know what's going on. The area is being overrun and inundated with outsiders that don't involve the local community.
- Spill response vehicles at the local level – need the resources (boats, vehicles, response equipment) ready to go. Infrastructure needs to be available – storage facilities, vessels, trained locals.
- The weather is always different from where the boats are coming from.
- Allow small groups of community members to work together to create concrete recommendations that can then be given to NOAA. Support these meetings.

**6) How could the ERMA tool be useful for planning restoration?**

**7) What information would you like to see included in the tool to support restoration planning?**

**8) What are best practices for community involvement in restoration and recovery?**

**Summary for report back:**

What are the big takeaways – what sentiment do you want to report back?

- Increased funding for culture camps and immersion schools.
- Student projects with mitigation of dispersants will help get students involved in the solution. A restoration focused science fair with financial support from NOAA could expand upon existing fairs.
- Work with ATC and Chukchi to increase the tech courses and training.
- Need to have local boats and vessels that have spill response ready to go and boats need to have life vests and red float suits so that people are fully protected, warm and safe. Need to be permitted, trained and ready to go.
- Go to tribal level first when coming in to work with community. Have a tribal consultation because they are the ones that are going to be dealing with everything. They usually get overlooked and/or are not invited. NANA and the NWAB should be in the loop to make sure everyone is working together. Tribes will consult with elders' councils.
- Kotzebue Sound Fisheries Association not as active as it should be – could be a resource. Regional Advisory Councils and mapping projects of subsistence use are active and could use more support.
- Funding for USCG Auxiliary to be better supported, consider adding hazardous response trainings.
- As ice melts, jurisdiction is lost along shoreline, needs to be protected as a traditional use area.
- There may be internal disagreement but that conversation is happening within the community rather than outside of it.
- Create an oil company that is owned by NANA rather than the corporation so permit and drilling process and decisions are in hands of the people who will be impacted.
- Federal change in policy about permit requirements. Because of the lack of inclusion, a lot of problems.
- Local knowledge and involvement is paramount.
- Support for processes to help validate local knowledge to Western culture and legalities (such as business licenses for elders).
- Federally, Chukchi Sea should be declared a national treasure. This would prevent development but allow for continued subsistence use.
- Difficult to identify options for restoring impacts to resources because of the interrelation of resources and people.
- Education of the industry about the spiritual connection to the land and water so that they drill a lot more safely.

Breakout Session I: Discussion of Oil Spill Response and Arctic ERMA

**Theme: Logistics of spill response, concerns, how local communities can most effectively participate, and how ERMA can help**

Breakout Group Questions:

- 1) What specific concerns do you have relative to planning and preparation for spill response?
  - Good contact numbers, need key players information to the local leaders. Where can we get funding for oil spill clean-up, community specific? (OPA – oil spill liability trust fund [uscg.homeport.com](http://uscg.homeport.com), third party claims for damage and living initially)
  - Migratory routes of sea mammals – will these routes be cleaned up first. What is the priority for restoration and recovery. We need a local plan developed to respond to an emergency.
  - How can we build community capacity to deal with oil spills. Example of Puget Sound community based responders
  - Oil spill response kits are located at facilities, but no training. Training is needed for school, store, power plant. Not enough training. (ie once in 15 years)
  - Location of pipeline in relation to water pumping, what to do in this case? Would water plant be shut down? What would communities downriver do for potable water? Need to consider all scenarios. Potential for spills upriver, not just coastal.
  - How do all of the agencies and entities coordinate. Who has resources for what? Including the various planning agencies, local organizations. Who to contact – who can do what? Especially within communities and the state. Responsibilities.
  - Address the need for a presence in the communities – physically bringing information and to listen to the concerns. This is the borough, federal agencies. Communication/be there to listen to the smaller communities. How can we better make this happen and be heard? Improve local engagement.
  - Does NANA have the ability/facilities to communicate incidents. Contacts should include oil spill response list at all facilities. It should be very obvious of who you need to call for response and disasters. First point of contact is the NW Arctic borough. Trainings have been conducted at the borough level with homeland security. HS develops response plans – need to be requested?
  - All disaster mitigations. Not enough on food and water security. NANA or borough maybe can develop who to call regarding issues such as this. Who will take charge in the community? Incident response plans – are they being communicated effectively.
  - Develop a response plan for the community. Look at incident in Kivelina for example – first reaction was protect drinking water at mouth of river. There was not enough boom. Even without declaration of a disaster, people respond regardless.
  - Coastal communities need to know what is happening –how can we protect ourselves from the spill as a community. No money equipment, training. 70-80% food could be lost to spill, if something happens to the ocean. How can you put a cash value on that – damage to health, social, economic, cultural aspect of the community.
  - If we lose whaling, way of life is lost.
  - Oil spill/government responsible to help communities protect themselves from an oil spill. Not just containing and respond, but keeping the oil away.
  - How can you put a value on a way of life. Can you? Can a NRDA do this? Will need to be addressed in sessions tomorrow.
  - Mental and health impacts, human rights – is this forgotten in NRDA/the communities.
  
- 2) What specific concerns do you have relative to spill response implementation and management?
  - How can the community pitch in and help in the event of a spill?
  - Instant communication is important in the event of a spill. The community can provide local knowledge especially regarding logistics, infrastructure, technical expertise, clean-up (if trained)
  - There is no infrastructure, training, or supplies. Not enough tools or knowledge of what response means/looks like. What do we use to respond. Especially coastal communities infrastructure, also training within the communities. Storage, equipment.
  - Location of caches – not in coastal communities? Closest to Kotzebue/NW Arctic is Nome. Not enough up north. Concern for

where caches will be located. Not just uscg with caches, also ACS maintains equipment. What will industry do to keep response plans active, what equipment will industry bring to area? Vessels, skimming, equipment.

-It is natural to respond to any incident. We have to work together, certified or not, we will be responding. Regulations and certifications should not stop us from containing a spill. How can we quickly get the equipment and aid in a response. If we see oil, we want to clean it up/help. First responders – reporter. How can the community become the first responder, we need to know where the resources are. It is natural to want to respond and protect our homes and environment, how do we build a local and effective local response capacity. Pass these concerns on to the USCG how can we fund and organize this?

-How can we avoid the mess. Exploration included. Ignored in the process is a concern. Government has the money/oil companies have the money – there is not a trickle down affect. What can we do to address the every day issues.

-Where can concerns be addressed in the NRDA. (tomorrow)

-First step – to be heard. Transparency is needed, complaining often left unheard.

-What is considered a disaster. Is there a barrel/gallon amount needed for a response? Small amount affect communities. Is it just a big spill that will get attention?

-for example, a small upstream spill. What can we do about it? Tides shift quickly and counter each other. Fuel is shifting back and forth. What can we do about this?

-How will oil behave in complex water systems. We need knowledge and advice from those that have experience. How can we communicate this knowledge effectively. How can we put this knowledge to use. Can we do experiments/research. How can we do both?

-ESI – experts from 1996. Out of date. Park Service would like the ESI replaced with new/real data. Park service is gearing up for data gathering. We are drilling in an ecosystem and the baseline is unknown. Proper NRDA and response not successful without that data.

-What am I going to eat during restoration and recovery. How can we maintain our healthy eating when our food is not safe to eat. Western food has introduced health issues.

-Migration – studies of how inland is affected by movement of species. Where subsistence occurs.

3) What are your initial reactions to the Arctic ERMA Prototype?

-More layers and information about response planning. What does exist already and what is good to have and needed to aid responders. Where are teams located? Where are resources.

4) How could the tool be useful for community involvement in spill response?

5) What information would you like to see included in the tool to support response decisions?

-Kotzebue IRA migratory seal telemetry – bearded and ringed seals. (Peter, NPS)

-All the baseline efforts by Park Service could/should be included. Where is industry in this to coordinate and perform and fund baseline studies?? Who is posing these questions to industry. Where is corporate responsibility. This is a problem of international conservation.

-Replace ESI with real/baseline data.

-Marine debris, esp plastics. Microplastics. Plastic volume numbers in the Pacific ending up on the Alaska shorelines. Pollution is a food security issue as well. Use as point for launching and doing cleanups. Especially considering restoration projects. In addition to spill preparedness.

6) What are best practices for community involvement in spill response, planning, and preparation?

-Are cumulative effects addressed in the NRDA? Cumulative as well as direct effects? Work from baseline, can only address effects attributed directly to the oil spill.

NWAB Workshop – Group D

May 22, 2012

Compiled by Hayley Pickus

Concerns:

- Expand the bench for receiving fuel in the communities
- Understanding a way of life
- Drill permiters don't know the ecosystem. Selling the rights to the bottom of the ocean without knowing resources and impacts.
- Cost of oil – twice as much despite being from our backyard. Processed oil costs more when it is shipped up north. Esp with snowmobiles as a way of getting around, this is a concern as dog teams/sleds disappears. It is a huge expense.
- Not a lot of work.
- Community has asked Conoco-Phillips for help funding studies. Not granted. If industries took these concerns seriously, it would be good for them as well, could prevent further and future conflict. Unless there is more that they are not telling us (industry). We are not even fighting yet. We try to work with the people *first*, we do not fight first, to avoid conflict.
- Subsistence study – add NOAA info as an addendum to community work

Report out:

- Communication
- Resources for the community
- Understanding a way of life, what subsistence means to the community, not just food.
- How do we establish a baseline

Breakout Session II: Discussion of NRDA, Restoration, and Recovery

**Theme: Logistics of NRDA, concerns, how local communities can most effectively participate, and how ERMA can help**

Breakout Group Questions:

1) What effects of oil spills most concern you (for example, health and use of natural resources)?

- Marine mammals
- Birds
- Fish
- Crab or other shellfish
- Land mammals
- Other cultural concerns (for example, education, language, arts)

-If mammals are affected by oil, what kind of health problems would the people be experience? Cancer, stomach problems – from ingestion of these mammals?

-Seals, is the spill large enough to be in the route where they migrate? Depends on how large the spill is, and how many would be affected depending on where migration routes are and where the oil is. Knowing how many were impacted. Animals stay with the ice edge, when the ice recedes, the animals travel north.

-Where would the oil/spill enter the food chain. Bottom feeders, if oil is at the bottom and they dive for food how will that affect us. Or if they are swimming through the oil, how will they be exposed. Where in the food chain does the oil affect us. Mammals eating oiled animals, or us eating oiled mammals, or us eating animals that eat oiled animals.

-There are seismic concerns, but we are focusing on a release

-Would populations change. How would exposure to pregnant females especially change population numbers into the future? This would largely affect subsistence if an entire generation is affected by a spill. Similar to the beluga incident.

-Bearded seals go to certain areas for feeding, we need to identify those feeding areas. They eat shrimp in a particular area near Red Dog Port- no longer present there, lead in the environment, no more shrimp. Would need to identify the feeding areas of the mammals, where shrimp are present. Study done by Kotzebue resident, did coastal research on what is in the benthos, crab (commercial quantity even). Identified fish etc.

-Hunters probably do have a good idea of what feeding areas are for seals, maybe whales.

-Silty water or clean water, currents affect feeding area. Seals also like different types of ice. Bowheads don't enter the sound.

-What is better, cleaning the oil or trying to "fix" it. Clean it up. Are there particularly sensitive areas where we might do more damage than healing. Passive clean-up.

-The best way to answer this would be go to the village and bring blank maps – share stories and knowledge about specific areas and land features. What areas would be helped or hurt. This will take time. Something like this would have to be done in every village – build the relationship and hang out in the tribal office. Discuss over food.

-Sitting down and talking is most effective (Sunday lunch with the parents is where the stories come out). It has to be a setting where people feel relaxed. Will this be a challenge for the coast guard?

-Would need to be done in advance of a response. Using the scientific support coordinator (NOAA, John Whitney) would be a good way to stop the rush of the response. However, this

should be a pre-planning activity. If you have gone in and gathered the information, you build relationships and you have a knowledge base and agreement. Much easier to take the initial time for future responses.

-Local knowledge is more effective than outsiders knowledge/ideas.

-Subsistence surveys –monthly/seasonal surveys. Caribou are hunted year round now. This will include maps. Bearded and spotted seals, gathering of eggs, plants (4-year mapping project with Zach)

-The best time to get the information is when you are out at camp, when you have 3-4 days. Listen! This is when the stories happen and we can learn the most. Draw and point an illustrate on the maps. There are contacts within the villages to make this happen.

-Birthing areas need to be identified.

-Studies will need to be held over several years because of the rate of change currently.

-Summer of 2010, hunted several baby seals (undernourished), but following year baby seals were in better shape. Same noticed with brown bears.

-Are studies necessary if native knowledge already knows? Does anecdotal evidence carry enough weight? What are the ways to collect information to be used as scientific data.

-Keep in mind, people are willing to let people in to ask these questions, however keep in mind that villagers have needs as well. Very willing to take people out hunting, but the most difficult thing for the hunters right now are expenses (gas prices!) When ice closes in or there is too much wind, often you have to head back in with all of your gear. 55 gallons to get out there is over 300 dollars – but there is a huge cost going back and forth. Whole family helps financially for gas. It would be considerate if research is being done that you help pay for gas. Although people won't expect or ask for this, although they need it, they won't say anything. It is important for people to understand how/why they hunt.

-This could also come up in restoration talks, potentially support to hunting community as part of a restoration effort.

-Kivalina – climate change affects and lawsuit means attention from foreign countries in the media. People have given so much, they are running out of steam. Often they do not even get to see the product – this is disrespectful and burning out. This is a concern also for agencies working within communities – how to return the aid they are providing. How do we make sure that we aren't overly imposing? Always give something back. These people are struggling to get out to the information, and we are asking for that information. Help them get there.

-The villages often do not see the results/reports of the work that they are studying/doing work to assist researchers and reporters.

-Will subsistence survey capture habitats? Feeding areas? Birthing Areas? Yes. Plants, roots, egg gathering, all subsistence animals. Where they eat, lay eggs, birth – looking at seasonal hunting and gathering. Where camps are located, where berries are gathered, etc.

-One concern would be – finding an infected animal and tests are ran. Often the villages never hear the feedback, they want to know what part of the animal is infected. Are some part affected and others not? How will young hunters learn? Checking the liver, if it is no good often the animal is thrown away. This is not wasting, this is what hunters are taught. If the outside of the animal is affected, sometimes has not reached the liver or the blood system. But the outside of the animal tells this story.

-People in Kivalina are concerned with the sharing of this information because it includes harvest information. The borough ensures that this information will not be available to anyone besides the borough, certain parts of this information. Looking for ways to not expose all of the

information, only what is necessary.

-Advisory committee for subsistence mapping project, concerned that not enough women on the advisory council (7 members from each village). Men are only half of the subsistence harvest process.

-Looking at animal use of the land.

-Elders have the concern of who is on the committee. Often when a stipend is involved, members are not necessarily those who harvest subsistence animals. This is a good source of information, but may not capture everything.

-Scenarios are drawn on the map. Codes are used to level out access. There is private information that only the families will have access to.

-Will this be available during a spill to the coast guard?

-Burial sites that elders tell villagers to not touch ie families of shamans. Areas told to stay away from.

-Bones often show up after storm along the coast. Do not disturb them.

-These areas that are sensitive/private might be the exact areas that response teams would need to know not to harm or respond and protect first. The coast guard has a way to deal with this where an area is known to be protected however the responders would not know why/the reasoning for the sites importance.

-During a spill there is an archeological/cultural liason who goes out with teams and would have this knowledge (local person)

-Is this an option during a smaller spill? Without a liason, when only small USCG group is responding – how would this information be communicated?

-Some of these sites do not meet requirements of official historical sites – however during a spill it is possible to identify locations to avoid, does not have to be a declared official site. This is usually run by the state historic preservation office. To request this, does the site have to be within the village? Probably the shpo would interact with all villages. It is possible to communicate this information during a spill.

-Look at land ownership, and who owns the land where these sites are.

-There is information about this and knowledge, it just might not be written down. 1% of what is out there is known by the archeologists, the remainder is really in the local knowledge. There is not a large enough presence on the ground to know all of these sites. There will be areas that may not be well known to responders – somehow these need to be taken into account.

-Concern with the time line. If oil washes ashore, how much time do we have to prepare plans and gather information about culturally sensitive areas? Often trajectories help with this – having an initial idea of where the spill might go.

-How will the oil spill affect the land animals? Caribou eat salt water grass. How do you keep animals away from feeding on oiled plants? Travelling through the plants? What will the affect be? Terrestrial animals go to the coast to escape mosquitos as well.

-Animals follow fish up the river to feed. More and more seals are found along the river, perhaps they aren't finding food in the ocean. Study on the seals is needed, now that marine mammals are living upriver. One walrus was found upriver. Polar bears are being seen upriver as well, because they can't feed in the ocean, they follow the fish in the river.

-Polar bears found wandering through town. Den in the mountains. Most polar bears in the spring usually head straight to the ocean.

-The seal last summer were sick but during the fall several went into the lagoon and stayed there. They must be trying to get away from something in the ocean that is not good for them,

being sick. One was found just staying on the lagoon ice, this is very unusual. There were a lot of seals in the Kotzebue bay as well this year.

-Concern with documentation of radiation and affects to animals.

-Kotzebue used to be polar bear capital of the world

-Concern, what will people eat instead if the food sources are affected? How would hunting patterns shift for those that rely on marine mammals in the event of a spill?

-A successful hunter knows the alternative.

-Costco will get rich.

-Can we consider the cost of shifts in other population dues to increasing hunting of a population due to affects of another population from a spill

-How many caribou is equivalent to one seal? Can we look at caloric numbers? What is the difference in the actual effort? Health? There is nothing that can replace seal oil. How do we calculate cultural effects also. Seal is so much a part of the diet.

-Seal oil is like Heinz 57.

-Open season for hunting. People fly and take away the resources. Tiered approach to hunting. End up opening hunting in the winter.

-Would RP be responsible for lack of food? Would this negatively affect the villages anyway?

2) Are there special habitats or specific areas that you are most concerned about? (for example, sensitive areas, historical sites, camp areas)

-Is subsistence survey adequate for oil spill concerns?

-Covers water and terrestrial

-Different ways of subsistence and ageing of animals – people hunt different ages of animals

-An idea for adding to the subsistence project: Train the hunters to gather information ie gps tracks of where they actually go. Because of the rising numbers of shipping traffic, the locations will be changing where animals are found. If they find a sick seal, we might want to know that location and mark it on a map. This is a challenge, to convince anyone of the things that need to happen. The knowledge gained working with the state and federal agencies is hard to communicate back, the need to add to anecdotal evidence.

-Document habitat deterioration, sick animals. How to convince people.

-Could train people to collect samples, for example a sick animal. You don't want to carry this around when you are hunting, but people are definitely capable of taking samples. This is a great idea.

-“scientific knowledge” vs. what is already know and has been observed for thousands of years

-How do we publish this information, get it out to the public. We need a place to document what is being seen.

3) Given the changing Arctic environment, what background/baseline information do you think we need to consider about the health of the environment before a spill occurs?

4) How could the ERMA tool be useful for evaluating effects of spills?

-If I was using ERMA, I would want to see a “today” screen, a screen of what is out there right now. What is happening right now, this is where we are at.

-Bookmarks, fast links. Frustrating to expand bookmark links everytime you go back to zoom tab.

- 5) What information would you like to see included in the tool to support evaluation of effects?
- 6) What are best practices for community involvement in evaluating effects?
- Quantification is needed for NRDA. How many are sick. How many are dead. Hunters can help with data collection – baseline population counts. Normal death counts. And then dead animals during a spill, can be compared to baseline. Locals could help count what is out there to gather some of these numbers needed for a NRDA.
  - Samples help build evidence for exposure.
  - Location of where people go to find these animals.
  - Time of year depends on what you are doing. If a spill happens in the spring, everyone is camping and hunting seal, beluga, birds on shore. Fish are going out, and by the time camp is set up, fish are headed back in.
  - If hunters were out collecting tissue samples, this could provide baseline health information for the animals. Could be compared to samples collected during a spill. Even if the population is already sick, these samples would help in comparison.
  - If tissue samples are collected, what happens next. Where would the samples go? Who pays for storage? Often the state vet will take these samples and analyze them.
  - Alaska beluga whaling commission teach people to collect beluga samples during hunting season. AWC does the same for bowheads.
  - Tissue are from the inside, what about the effects seen on the outside of the animal?
  - Would pictures be helpful for baseline information? Including this with a sample?
  - Red dog collected samples a few years ago
  - This could easily be done during normal work that hunters do
  - Population data is lacking. Citizen science numbers can be used in NRDA.
  - Think of a murder trial.
  - We are preparing for our death, we need the baseline data to prove where we want to be at after a spill
  - Despite our subsistence values, development will still happen. Development won't avoid the subsistence areas, they see dollar signs but not the value of the people using the land and the water as a way of life.

Small Group Breakout Session III: Discussion of NRDA, Restoration, and Recovery  
**Theme: Exploring restoration options and how ERMA can help**

Breakout Group Questions:

1) What specific concerns do you have relative to restoration and recovery?

- How do you restore culture
- Need more examples of actions that qualify as restoration would be helpful
- How do you learn how to hunt without the animal being present? Losing this knowledge would be bad, for example how to shoot an animal properly so it can be recovered. Can we outlive the problem?
- What is the science on how oil breaks down in the cold environment? We don't know how long the oil will be around.
- The arctic is especially worrisome because of the connection to the culture – so intimately tied to the resource that could be effected or lost. The habitat may be resilient enough to recover, but the link to culture is harder to recover.
- How do you minimize this harm? How can we deal with this reality?
- Thoughts of restoration – how do we make it easier/better for future generations?
- What are other examples? What are subsistence hunters in LA doing? Habitat restoration. Not sure if this will work up here.
- Culture camps – opportunities to pass down the culture
- How to endure
- Could we go to a community kitchen to eat?
- Subsistence claims can be made (monetary)

2) Are there examples of habitat areas that could be improved?

- Rock formations and habitats could be created for seals, fish lay eggs. Have it be a tourist area, so you could raise money as well as have a protected area for the animals to recuperate.
- This has been done on islands where herrings lay eggs. Seals eat herring, fish. Is there a way to increase what the seals eat? Rocks for herring to lay eggs? Herring hatcheries? Would this help seals find food easily?
- If herring were lost due to oil? If you can artificially seed an area, you could “convince” seals to get back to a place
- Migratory animals, often just passing through to feed – how could we develop spawning grounds?
- Create a fishery for money? Is it feasible to do in this area
- Restoration would depend on when the spill occurs.

3) Are there other sources of contamination that could be controlled?

4) What traditional methods of restoration and recovery are practiced?

5) What could be done to sustain cultural and subsistence practices that might be affected by oil?

- fly subsistence hunters out to other areas to maintain subsistence in the fall out time
- For example, more opportunities to virtually (?) hunt and learn about the animal. Take it apart from the outside in. Have a way to preserve this culture/discussion without the resource. Prepare materials to share and learn from.
- This could be difficult because as a hunter, you begin from a young age. If you get an animal, you give the entire animal away. How do you capture these stories/testimonials?
- Hunters often share the hunt. If you share and give away, you know you get more. How can we pass this tradition on?
- Add boulders and rocks to restore habitat? So that they are in an area that they cannot be hunted.
- If responding as a first responder, who will pay for the gas for your boat. Who sets regulations for community members to clean oil? (response)

- subsidize gas for hunters, but what would they hunt?
- Is nature running its course the only option?
- Habitat restoration – hard because females go back to where they were born.
- Fertilization and bring to a hatchery?
- Sheefish – cold pristine water. It would take a lot to replicate these perfect spawning areas. It is not just the habitat, but also the migration, how they spawn, etc that makes the fish healthy. There could be ways to recreate the habitat.
- Red Salmon spawn in similar areas (fall, travel with sheefish). Other concerns such as hydroelectric dams and facilities that will affect these spawning areas. Pike, white fish (winter)
- June is when fish start populating sound again, used to be July
- Could we restore the organisms that fish are eating? Assuming the oil is lingering/ingested by the organism.
- An ecosystem model in place would be helpful. Who eats what? So that we can understand not only subsistence animals, but also the rest. We could then understand when parts of the ecosystem break, what do we introduce something to fix what is broken?
- Change leads to a good hunt, the system is very dynamic. It is hard to plan in such a general environment, we would need more specific info about the spill. This could change on a weekly basis.
- Are there seasonal restoration projects?
- Are there spawning ground that are currently under threat from alternative pollution sources? We could potentially protect these as future restoration projects.
- Restoration does not necessarily have to occur in the area of the spill. Especially thinking of migratory species.
- Some species that never return – like a snipe/sandpiper. We never looked into that. Tratruck.
- Villages are all connected, if something happens, go to the community and find out what can be done
- more ideas if we travel to the communities themselves.
- Understand the food chain. Start from the smallest living thing up to the whale.
- We have to restore the food chain.
- What do we do. How do we know what to do. We see the problem, but do we know how to fix it.
- Who are the experts. Those who live off the land know the most about the environment.
- Nesting areas are important.
- We need public input at the start to come up with ideas that will inform restoration later
- Local hunters and gatherers would be useful in restoring the land. They would have more knowledge because they are out there all the time. They would recognize seasonality.
- Marine restoration is more difficult than land restoration might be
- Potential for spills from other areas based on currents
- Really should go to the villages – spend time listening to what they have to say, they will have the stories and the ideas.
- I see this as hopeless. Everything eaten is from the ocean, the ocean is very fragile. Thinking about an oil spill and how it will affect the food chain – it filters down to the smallest living thing. Even without an oil spill, the creatures are sick. The changes are happening quickly.
- Not enough research done in the Arctic waters to understand what is out there.
- Acidification
- Food eaten is not inspected, need more of western science to help understand. We need a long-term study to establish an accurate baseline.
- It is a cycle, there is an abundance now, will be less, and it will cycle through. Berries, rabbits
- Installations of massive alternative energy in every village. Add to Kotzebue's wind farm?
- There are long-term studies, people have been living off the land for thousands of years. These data need to be given more weight. What populations did, when, where they went, etc. It is not someone's story, it

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is data. It is not recognized. This knowledge needs to be recognized as valid information.

-This workshop is a first step to this.

-Subsistence is also the health gained by the expenditure of the hunt. This would be lost without the subsistence. How do we restore that?

- 6) How could the ERMA tool be useful for planning restoration?
- 7) What information would you like to see included in the tool to support restoration planning?
- 8) What are best practices for community involvement in restoration and recovery?

Breakout Session I: Discussion of Oil Spill Response and Arctic ERMA

Theme: Logistics of spill response, concerns, how local communities can most effectively participate, and how ERMA can help

Breakout Group Questions:

- 1) **What specific concerns do you have relative to planning and preparation for spill response?**
  - We need to be ready, cannot wait until it happens, at the village level
  - **Have to bring planning to village level, this workshop is first step, EPA and other villages involvement**
  - Response Equipment concerns, harsh environmental conditions
  - General outreach to communities regarding spill response is general needs to occur ie: boom, roles
  - Winter time response issue- how long will it take to know if a spill is occurring?
  - Perhaps there needs to seasonal response plans, summer vs. winter. Our people from villages being involved in these plan development
  - **Current (ocean current) issues blur the line between offshore and onshore issues, hard to tell where it will go**
  - Concerns about opening to Barrow Strait ship traffic
  - NOAA is concerning shipping incidents
  - Pipeline issues in the future if exploration turns to production
  
- 2) **What specific concerns do you have relative to spill response implementation and management?**
  - **Training at the Village level is very important**
  - Documentation of local knowledge, need for direct local knowledge
  - **Local knowledge protection issues** – respect of govt to govt relationship, importance of tribe rights to protect cultural knowledge
  - **People may have concerns about information security, these issues may become important during spill response**
    - To deal with this issue it is a good practice to have more ‘general’ area of importance

- **Having training in village – perhaps ‘community response agreements’, which are being used in some communities**
  - Location and weather conditions constraints are very important issues to consider
  - Voice of villages- extremely important that peoples voices be heard. There is allot not heard. Who will speak for the people?
  - Western and Native economic systems, these systems have very different components and cultures
  - Remote locations – results in very high cost of living, therefore we have to live off the land, have to go to the coast ,
- 3) What are your initial reactions to the Arctic ERMA Prototype?
- How do you assess damages without staying at location for a long period of time?
  - **Question regarding ocean floor mapping, what types are features are being mapped?**
    - **Perhaps knowing this might help determine oil movement**, ie-there is a mountain and consistent earthquakes and that region – this area is a feeding ground for several species, hunting occurs in this area. They know where it is – maps are not used
  - Regarding importing knowledge into ERMA- there is some older maps. Tides sometimes strong, lots of low country in some areas which will be covered during flooding
  - **TEK are the hardest resources to find, the issue of TEK protection is also very key. ERMA may be a great use as there is password protection**
  - **Make sure whatever approach we take – it needs to be useful to the communities, this may be a different tool than ERMA.** If we cannot find a way to ensure information is going to be protected data (TEK) should not be incorporated into ERMA.
  - Alongside of this is the importance of cultural site location protection. It is possible to protect this data
  - One issue is technical, another is showing value of tool at the village level, ongoing to dialogue is essential. Relationships!
  - Challenge- how to work with communities if funding issues become a problem.
  - How ERMA works in an emergency situation? How much do you rely on maps versus experts?
  - **Knowledge of key contacts will be important during an actual incident.**

4) How could the tool be useful for community involvement in spill response?

- Protection of subsistence and lifestyle. Baseline is very important, getting first step in place
- Protection issue – need to focus on the whole environment. Rivers divide and divide – creates a larger area that needs to be protected
- Work on starting being ready is very important, cannot stop after this workshop, we have to keep going.
- Something a Village could do to response quickly, initial response is very important
- A basic ERMA 101- a give to villages-one pagers to – what is it and how it will be used – need to reach out to broader audience is required. Right now the layers are based on a Western view- we need to adjust this to reflect more concerns/interests of the community.
  - What is Arctic ERMA
  - How can arctic erma be used to protect subsistence?
  - How will ERMA be used and for what purpose?
  - What measures will used to protect TEK knowledge?
- Community concerns/cultural areas – if these layers are created protection of this information is key
- Accountability – what are the expectations/responsibility of the erma team to communicate to those who contributed information to erma that it is being used?

5) What information would you like to see included in the tool to support response decisions?

- Access issues with land ownership, what kind of equipment can you get in? Private/public access issue.
- Spill response equipment that is available for use in the area (eg: AVEC) – the village should know what resources are there to respond
- Nice to have the multi resources at hand (contingency plans from local entities in the Village – schools, store, fuel farm)
- Studies from all the various agencies regarding location of species and the possible impacts of a spill on those species. Pulling together of information that exists.

- **Distribution of this information to specific Villages – distribution of knowledge**
- **Metadata – needs to show use of TEK and the way to connect this TEK to the sources (contact information).**
- **Can ERMA be used for different types of response issues? ie: tsunami marine debris**
- **Updating the maps are very important, its changing. Updating maps will help.**

**6) What are best practices for community involvement in spill response, planning, and preparation?**

- **Training!** This includes various aspects of the community. It teaches people what to expect if an incident does occur.
- **Have Villages create plans that tie into Subarea plans**
- **Using NWAB LEPC – will be helpful to distribute knowledge –**
- **A best practice is to Practice**
- Conducting outreach and training
- Need to work with corporations, the responsibility should not fall all on the Village
- **Strong local consultation – previous exercises have has provided too little time for input and review**

Breakout Session II: Discussion of NRDA, Restoration, and Recovery

Theme: Logistics of NRDA, concerns, how local communities can most effectively participate, and how ERMA can help

Breakout Group Questions:

**1) What effects of oil spills most concern you (for example, health and use of natural resources)?**

- o **Marine mammals**
- o **Birds**
- o **Fish**
- o **Crab or other shellfish**
- o **Land mammals**
- o **Other cultural concerns (for example, education, language, arts)**
- **Microscopic communities, this should be added to this list of communities**
- **Look at things in more of a network manner – hard to tease out individual pieces. For instance the issue of hunts – cannot separate issues. Very different cultural values – Western system controls of the native system**
- **You cannot separate species, but it may help to look at individual species because it helps prepare**
- **Oil spill can happen at all times/seasons, biggest concern is the subsistence lifestyle- if you get an oil spill it will get cut off, if this occurs it will have large effects at the local level.**
- **We need to document so when a spill does occur we are prepared**
- **Subsistence at a local level- the ocean and land is our “safeway”**
- **Went out with EPA, looked at bugs under the ice, if those things go than something is wrong, this trip helped understanding**
- **Economy is not good in rural areas, unless there is development, so people rely on subsistence. If there is affects on species it will go down the foodchain**
- **Types of key food (differ due to geographical area) –**

### **Caribou**

**Fish (Noorvik – salmon, Selwick – other species than salmon), grayling, trout, mudshark, Sheefish, whitefish, herring, smelt, blue crab**

**Pike, king crab,**

**Birds and eggs (seagulls and ducks)**

- **Subsistence mapping project – has a list of what was harvested during each month (existing information) – Noorvik was mentioned– follow up is needed regarding data sharing issues**
- **Other species of importance**
  - ducks geese and swans
- **What if your food source is cut off? This is beyond this workshop but it is a very important subject- it also has a NRDA value – how do you feed people, how much does it cost**
- **The borough as a whole they know all the villages, if a village needs help they will get help**
- **Beluga – used to be in Bay – this was a main staple,**
- **Kivalina – Bowhead and Beluga, spotted seal comes with the end of the ice, walrus- start to migrate in the Spring**
- **Kotzebue – still getting Beluga**
- **Seals moving up River – polar bear near Noatak, stomach was empty – going inland for food**
- **Clams may not be subsistence but they are important to Walrus.**

**2) Are there special habitats or specific areas that you are most concerned about? (for example, sensitive areas, historical sites, camp areas)**

- **Subsistence mapping – an agreement with this project must be made – but this is a big trust bridge –**
- **Fuel shipping routes – keep an eye out on these areas because of the potential for spills.**

- **Again trust issues are important to protect this information - development of this relationship is vital – we all need to be working toward this goal – this is a big lesson thus far**
- **When planning for the future Elders have always said ‘keep the children in mind’**
- 

**3) Given the changing Arctic environment, what background/baseline information do you think we need to consider about the health of the environment before a spill occurs?**

- **An oil spill is going to accelerate these issues**
- **It may not be possible unless you determine the animal itself**
- **The Western methods are different, but how can we get folks with TEK to capture changes they are seeing, how do we track this? It will provide a long term record for the community. Some training was done in Bethel regarding developing this local record**
- **In most communities EPA has people, when animals are harvested these people may be able to track these**
- **AK Native Tribal Health Consortium - ‘LEO’ program – local observers – mapping project and observing and documenting network.**
- **By creating a record it helps support NRDA process**
- **Maniilaq Association – they have a dept that monitors health of animals – associated with Fish and Game – ask the public to report things they are seeing**
- **Community members know the species but in case of an oil spill experts will be needed to study the impacts (of oil) on the animal, they know the type of damage – community members know the animal - but biologist will be able to help determine damage**
- **Elders – they are the experts – go to the elder council to collect information, you have to go there and get it – this is the next step in the mapping project – but it will take years to release this information**
- **NPS and mapping project, NANA – these are also key sources of information**

- **Oil companies- perhaps getting funds from them to help gather this information – they are coming into our backyard – fed govt could say before you do this you need to help us prepare**
  - **Oil companies are not the only sources of spills – so baseline efforts need to come from various places**
  -
- 4) How could the ERMA tool be useful for evaluating effects of spills?**
- **More interaction with ERMA will help the capacity to answer this question**
- 5) What information would you like to see included in the tool to support evaluation of effects?**
- **What are the subsistence species by the month and their habitats and food sources**
  - **Books – published knowledge – regarding subsistence, NPS most likely has a copies of these –**
- 6) What are best practices for community involvement in evaluating effects?**
- **Northslope – example - working with village response teams (VRT) - one issue is that they are always response drills – no post spill training NRDA – a fake damage assessment would help to develop these relationship.**
  - **They are in the process of setting up more VRT – occurring in the NW Arctic Borough**
  - **Last summer there was an orange substance issue that had a reporting chain**
  - **Facebook – quick communication method is used**
  - **Public meeting, email, newsletters, CB's,**
  - **Community involvement – door prizes help get people in the door at meetings**
  - **Best Practice – communication – keeping in touch –**

- **The more we can do ahead of time – setting the baseline – it's going to help in the case of an event – NRDA has had big issues getting involved in the response operations**
- **Villages have done table top drills but no NRDA issues**
- **Natural issues are occurring – they have been called about oils spills that where caused by natural releases, having local knowledge of these areas will be helpful in separating sources of impact**
- **Conducted water testing that had cyanide – from old mining operations –**
- **More training on damage assessment – again more training and NRDA drills**
- **Subsistence mapping project – done in Nome – North Slope is also conducting – all of the boroughs are conducting these subsistence mapping projects**
- **Author – Earnest Birch – had a book published in the 70's regarding subsistence – well respected book**
- **Perhaps knowledge such as book can be placed into ERMA – reference documents – including surveys – geo reference**

Small Group Breakout Session III: Discussion of NRDA, Restoration, and Recovery

Theme: Exploring restoration options and how ERMA can help

Breakout Group Questions:

- 1) **What specific concerns do you have relative to restoration and recovery?**
  - **This question and communication, all presentation and surveys, needs to be rephrased so this question can be asked to villages and other**
  - **Perhaps put it in laymen's terms - If there is an oil spill how do get it back to the pre-oiled state?**
  - General concern- the way these questions way set up were not very accessible
  - Compensation – it cannot be fully done,
  - Two years Caribou took a different migration route – so people had to change trade – other villages helped –
  - Psychological impacts must also be considered
  - Question and discussion regarding if DWH impacts were restored
  
- 2) **Are there examples of habitat areas that could be improved?**
  - Examples given of ongoing NRDA case restoration
  - Put a protection on those species which were lost
  - Tundra is a sponge and permafrost – response activities can do more damage to these habitats, this must be kept in mind
  - Recovery to what? Do you know what you are recovering too? There needs to be an agreement on what was injured
  - There are spills now in the Arctic that need to be studied. Ie: groundwater issues and tank farm leaks – these case should be studied. These spills occurred 30-40 yrs ago but the fuel is still around – fuel on top of the permafrost
  - **Studies need to occur now – studies on how to included water table quality and removing fuel contaminants from water tables (ie: in Kotzebue)**

- **Loss of the clothing from species**
- **EPA IGAP – conducting river quality testing – perhaps a source of baseline**
- **Renewable energy – solar panels – wind energy – hydro (Ambler is planning for hydro)**
- **PWS – lingering issues ie: herring. We can see what does not recovery and see what can recovery to help focus restoration efforts.**
- **Mapping is going to be very valuable**
- **When we loss Beluga in the Bay – large loss of oil and meat – so they starting hunting seals as it was the next best thing. This would occur in future situations**
- **If one species is impacted, the community must go to the next**
- **Infrastructure – existing resources may help-try and help some things recovery – we should always be looking at what type of infrastructure we have that could be used in a different way for restoration (or response).**

**3) Are there other sources of contamination that could be controlled?**

- **Naturally occurring asbestos**
- **Car batteries, lead in landfill**
- **Natural oil seeps**
- **Sewage, some villages do not have any sewage treatment**
- **Mine – brings in processes to clean discharge – but the river bottom has changed since the mine has started, the color of the upper section of the river has changed – its long term**
- **Metals in landfills – no recycling systems exist**
- **For technology disposal there has been collection and shipping out of certain villages (Noorvik) (via EPA)**
- **Waste oil – currently being burned**
- **Drilling fluid and radon concerns**

- 4) What traditional methods of restoration and recovery are practiced?**
- 5) What could be done to sustain cultural and subsistence practices that might be affected by oil?**
- 6) How could the ERMA tool be useful for planning restoration?**
- 7) What information would you like to see included in the tool to support restoration planning?**
- 8) What are best practices for community involvement in restoration and recovery?**

#### Closing thoughts

- restoration – those who caused the damage please do what you can and then leave – if you conduct restoration it may have impacts on other areas
- Keep it simple: Communication. Conversations is in two languages, so keep it simple while moving forward
- If there is a spill they should do what they can quickly. The resources are our bread and butter. The cold climate poses challenges.
- No matter what the future scenarios are, shipping will be occurring, so we need to be prepared.
- Restoration – hump dumpty sat on a wall
- A spill is going to happen, good to have a dialogue and plan for the future, have to have real responsibility to plan within the community, they know what resources need to be protected
- We need to be prepared, let's not wait, this workshop is a start, we have to prepare, happy to be here to bridge the gap between the agencies and the villages, we will keep in touch, we need to keep it going, we need to support each other, it's possible, always think possibly
- We need information before the event, the more baseline information about subsistence so we can say what we know, and not after the fact, it is documented.
- Integrating resources, no one cares more about the resource than those who use it. Stay in communication so we know what other science is out there, dialogue, being proactive
- The oil companies want the oil and want to get out, they are not concerned, all the damage that will be done we will be left with it, you cannot stop progress (ie: red dog) hope they restore as much as they can

# WELCOME

## Northwest Arctic Borough: Oil Spill Workshop

May 22 - 23, 2012



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## Logistics

- Fire Exits
- Restrooms
- Dining: breakfasts, lunches & snacks
- Tuesday evening
  - Fran Ulmer US Arctic Research Commission presentation & reception
  - Movie (optional)
- Logistical questions see Kathy Mandsager or me



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# Thank You

- Thank you for warm welcome
- Thank you to Northwest Arctic Borough
- Thank You to NOAA for funding workshop
- Thank you to Park Service for facility
- Thank you to OSRI for travel scholarship funding



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# Thank You

- Thank you to Workshop Organizing Committee:

Ukallaysaaq Tom Okleasik

Puya Bob Schaeffer

Michael Oliver

Lincoln Saito

Wendie Schaeffer

Millie Hawley

Amy Merten

Mary Baker

Scott Pegau

Cheryl Rosa

John Whitney



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# THANK YOU!



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## Coastal Response Research Center

- Partnership between NOAA's Office of Response and Restoration and the University of New Hampshire
  - UNH Co-Director - Nancy Kinner
  - NOAA Co-Director - Amy Merten
- Funding for oil spill research was decreasing
- Coordinate and fund oil spill research



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## Overall Mission

- Conduct and oversee basic and applied research and outreach on spill response and restoration
- Transform research results into practice
- Educate/train students for careers in spill response and restoration
- Facilitate workshops bringing together ALL STAKEHOLDERS to discuss spill issues and concerns



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## OIL SPILL (Offshore Drilling or Transportation)

Response

Natural Resource Damage Assessment  
(NRDA)

Restoration and Recovery



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## Workshop Background

- April 2010 - CRRC hosted workshop in Anchorage "NRDA in Arctic Waters: The Dialogue Begins"
  - Goal: initiate dialogue to identify data gaps for resources at risk from oil spill
- April 2011 - CRRC hosted workshop in Anchorage "Arctic ERMA®"
  - Goal: provide information & tools to support response decision-making for spills in Arctic and subarctic waters



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## Workshop Background

- April 2011: Arctic Communities Organizing Committee formed
- Regular meetings for past year
- Organized this workshop
- Plan is to host similar workshop in Barrow
- Goal: continued collaborative discussion on NRDA and Arctic ERMA



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## Kotzebue Workshop Goals

- Discuss community involvement in spill response and natural resource damage assessment (NRDA)
- Integrate local community knowledge into Environmental Response Management Application (ERMA®)
- Enhance relationships between local communities & governmental agencies regarding planning and preparation for potential oil spill response & restoration



## Tuesday Morning

AGENDA - DAY 1	
9:00 AM	Opening Prayer Local Elder
	Welcome - Northwest Arctic Borough Mayor Siikauraq Martha Whiting
9:15 AM	Welcome and Overview of Meeting Overview of Oil Spill Response, Planning & Preparation, Arctic ERMA®, NRDA and Restoration/Recovery Nancy E. Kinner, <i>UNH Co-Director, CRRC</i> Amy Merten, <i>NOAA Co-Director, CRRC and Chief NOAA's Spatial Data Team</i>
9:30 AM	Goals and Expectations of This Meeting Ukallaysaaq Tom Okleasik, <i>NWAB</i>
9:40 AM	Participant Introductions & Expectations
10:20 AM	Break
10:30 AM	Introduction to Spill Response for Offshore Oil Developments/Exploration in the Chukchi Sea Francis Schiano, <i>USCG</i>
10:50 AM	Ecological Risk Assessment for the Northwest Arctic Subarea Contingency Plan Mary Baker
11:00 AM	Introduction to Arctic ERMA® Amy Merten
11:30 AM	Lunch (provided)



## Tuesday Afternoon

2:45 PM	Group Reports to Plenary Session
3:30 PM	Introduction to Natural Resource Damage Assessment (NRDA), Restoration/Recovery Mary Baker, <i>NOAA</i>
4:30 PM	Adjourn meeting
5:00 PM	Presentation: "How can science improve decision-making in the Arctic?" Fran Ulmer, <i>USARC Chair</i> (This will be held at the Nullagvik Hotel's conference room. Reception to follow)
6:30 PM	Movie Night at the Heritage Center (optional)



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## Breakout Group Questions

### Session I: Discussion of Oil Spill Response & Arctic ERMA

*Theme: Logistics of spill response, concerns, how local communities can most effectively participate, and how ERMA can help*

- What specific concerns do you have relative to planning and preparation for spill response?
- What specific concerns do you have relative to spill response implementation & management?
- What are your initial reactions to the Arctic ERMA Prototype?
- How could the tool be useful for community involvement in spill response?
- What information would you like to see included in the tool to support response decisions?
- What are best practices for community involvement in spill response, planning, and preparation?



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# Wednesday Morning

## AGENDA - DAY 2

- 8:30 AM     **Opening Prayer and Announcements**  
Ukallaysaaq and Nancy Kinner
- 8:45 AM     **Arctic ERMA® in NRDA and Restoration/Recovery**  
Mary Baker, Amy Merten
- 9:15 AM     **Small Group Breakout Session II: Discussion of NRDA, Restoration/Recovery**  
*Theme: Logistics of NRDA, concerns, how local communities can most effectively participate, and how ERMA can help*



# Breakout Group Questions

## Session II: Discussion of NRDA, Restoration, and Recovery

*Theme: Logistics of NRDA, concerns, how local communities can most effectively participate, and how ERMA can help.*

- What effects of oil spills most concern you (for example, health and use of natural resources)?
  - Marine mammals
  - Birds
  - Fish
  - Crab or other shellfish
  - Land mammals
  - Other cultural concerns (for example, education, language, arts)
- Are there special habitats or specific areas that you are most concerned about? (for example, sensitive areas, historical sites, camp areas)
- Give the changing Arctic environment, what background/baseline information do you think we need to consider about the health of the environment before a spill occurs?
- How could the ERMA tool be useful for evaluating effects of spills?
- What information would you like to see included in the tool to support evaluation of effects?
- What are best practices for community involvement in evaluating effects?



# Wednesday Early Afternoon

11:00 AM **Small Group Breakout Session III: Discussion of NRDA, Restoration & Recovery**  
*Theme: Exploring restoration options and how ERMA® can help*

**Breakout Group Questions:**

- What specific concerns do you have relative to restoration and recovery?
- Are there examples of habitat areas that could be improved?
- Are there other sources of contamination that could be controlled?
- What traditional methods of restoration and recovery are practiced?
- What could be done to sustain cultural and subsistence practices that might be affected by oil?
- How could the ERMA tool be useful for planning restoration?
- What information would you like to see included in the tool to support restoration planning?
- What are best practices for community involvement in restoration and recovery?

12:30 PM **Lunch (provided)**

1:30 PM **Group Reports to Plenary Session**



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# Wednesday Afternoon

1:30 PM **Group Reports to Plenary Session**

2:15 PM **Small Group Breakout Session IV: Populating Arctic ERMA® with Data/Information**  
*Theme: Determining which information would be most helpful*

**Breakout Group Questions:**

- What data sets do not yet exist, but are needed to support planning or decision making?
- What are the output requirements and/or functionalities of these data?
- Are there any access restrictions to these data?
- What are the highest priority data needs?
- Where do important existing data sets currently reside?

4:15 PM **Wrap Up**

5:00 PM **Adjourn**



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## Workshop Outcome

- Report on workshop to be widely circulated
- Improved Arctic ERMA®
- Enhanced relationships between communities & government agencies



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## Participant Introductions

- Your name
- Your affiliation
- What is your expectation of this meeting?



## Ground Rules

- Respect others:
  - One speaker at a time
  - Share the airtime equally with others
  - No side conversations
  - Listen to others
- Turn off electronics
- Respectful of your time commitment



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# Oil Spill Response



CAPT Jason Fosdick  
Commander, USCG Sector Anchorage



*hazwopER*

## Oil Spills



Flash Point

Toxicity

Exposure

Incompatibility  
with oxidizers



## U.S. Coast Guard Area of Responsibility

- The USCG Captain of the Port (COTP) is the pre-designated Federal On-Scene Coordinator (FOSC) for oil spills in the Coastal Zone
- Coastal Zone- All U.S. waters subject to the tide and all land surface or land substrata and ground waters 1000 yards inland
- Extends to specific rivers and in the Exclusive Economic Zone

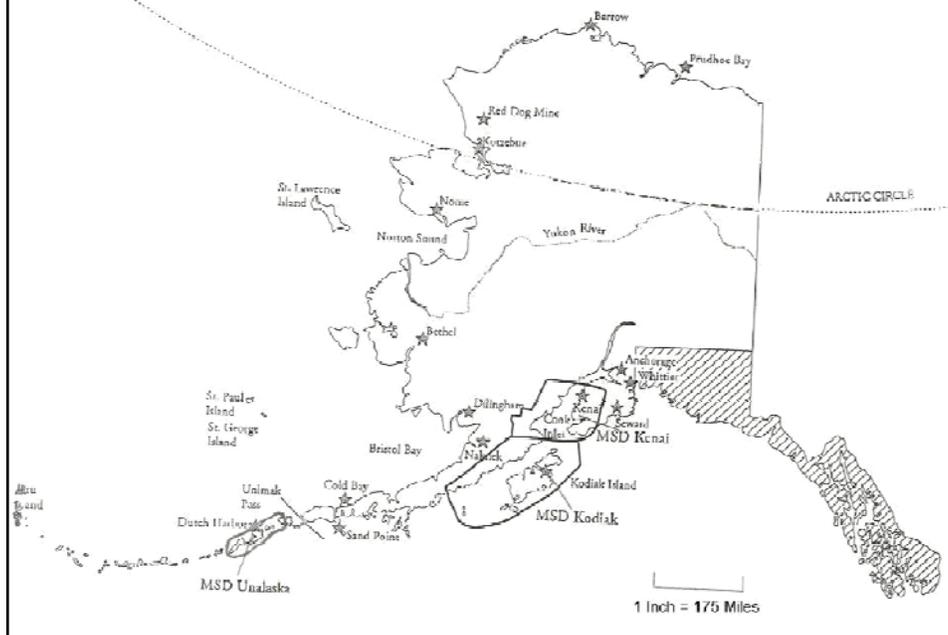


## U.S. Environmental Protection Agency Area of Responsibility

- The U.S. Environmental Protection Agency is the pre-designated FOSC for the Inland Zone
- Inland Zone- all land surface or substrata, rivers, streams, and drainages inland of the Coastal Zone to include Tundra of the North Slope

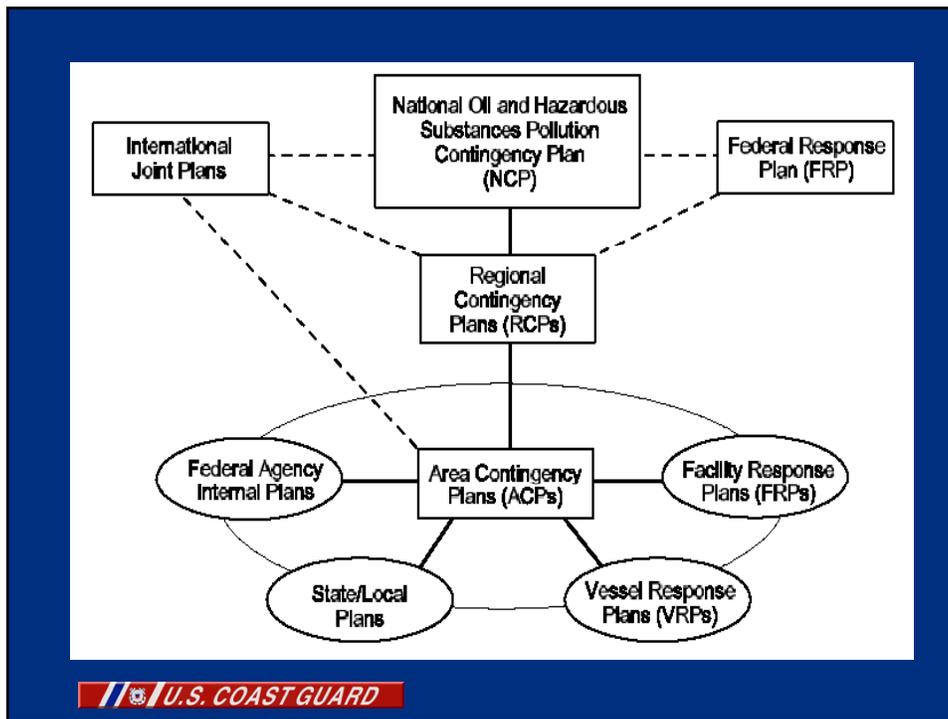


## COTP Zone Western Alaska



## Unified Plan

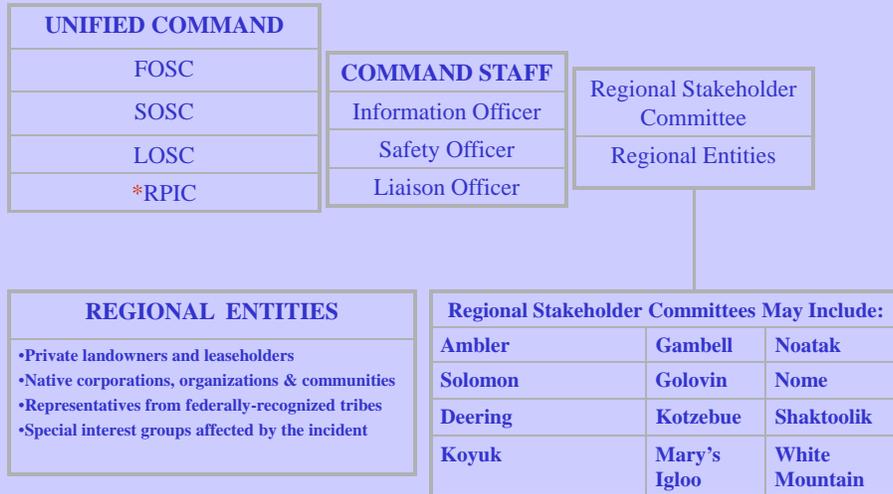
- The Unified Plan is a comprehensive pollution response doctrine that defines the organizational and procedural framework of the Alaska oil spill response network
- Ten Sub-Area Plans supplement the Unified Plan and describe geographic specific strategies for a coordinated federal, state and local response
- Joint Marine Pollution Contingency Plan with Canada supplements the Unified Plan



## Building Unity

- Multiple Memoranda of Understanding (MOU) or Memoranda of Agreement (MOA) describe cooperative relationships between various agencies and governments
- **Annex K of the Unified Plan** includes copies of these MOUs/MOAs
- Partnerships with multinational organizations, private industry and academia should be cultivated to enhance unity
  - Arctic Council
  - Joint Industry Program (JIP)

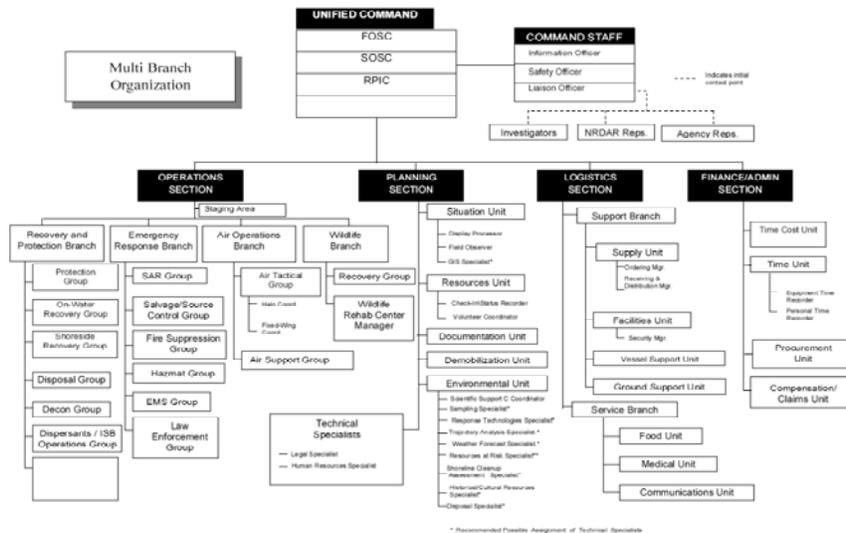
# Unified Command Organizational Makeup



\* (RP) Responsible party, if known, may willingly integrate with the Unified Command



# Modular ICS Organization for an Oil Spill



## Case Study: Wainwright Mystery Sheen, 10JUL09

- 0830: Notification of oil like substance drifting off the coast of Wainwright, AK
- 1100: USCG Assessment Team deployed on chartered aircraft
- 1400: Unified Command meeting conducted in Anchorage to develop Incident Action Plan
- 1530: USCG aircraft diverted to Wainwright
- 1630: Assessment Team lands in Wainwright; integrates with local personnel to conduct helicopter over flight and vessel survey
- 1900: Sample taken of substance; later confirmed to be algae



## Mechanical Equipment Overview

- United States Coast Guard (USCG)
- Alaska Department of Environmental Conservation (ADEC)
- Navy Supervisor of Salvage (NAVSUPSALV)



Response gear from every agency can be transported via any available military aircraft or vessel or via commercial chartered aircraft, train, truck or vessel



## USCG Oil Spill Response Equipment



 U.S. COAST GUARD

## NAVSUPSALV - Oil Spill Response Equipment

- U.S. NAVY Supervisor of Salvage

NAVSUPSALV - <http://www.supsalv.org/ESSM/>



Located at FT. Richardson in Anchorage, AK

- Strong Open Ocean Recovery Capabilities
- Skimmers, Hard Boom, Support Vessels, Vacuum Systems, Storage Bladders, Command Trailer (with Communications Suite), Submersible Pumps, Arctic Oil Recovery System, etc.
- Salvage Equipment, Transfer Systems, Oily Water Separators, Viscous Oil Pumps

 U.S. COAST GUARD

All equipment is deployable onboard any military cargo aircraft, ship, train, or truck.

## In-Situ Burning Option

- In Situ burning considered a highly effective alternative to mechanical recovery
- In-Situ burn guidelines revised in March, 2008
- Suite of In-Situ burn equipment located at ACS facility in Prudhoe Bay
- Chemical herding agents may be useful in Arctic conditions to facilitate in-situ burning



## Dispersant Option

- Technical Element
  - Aerial Dispersant Delivery System (ADDS) in Anchorage and Valdez
  - 65,000 gal of Corexit 9500 are stockpiled at the SERVS facility in Valdez, AK
  - Lynden Air and USCG C-130s are ADDS capable
- Non Technical Element
  - Dispersant guidelines are currently under review
  - Environmental risk assessment and dispersant impact study lacking for Arctic region



## Oil in Ice Response Tactics

- Several tactics manuals exist for response scenarios in Arctic and ice infested waters
  - Emergency Prevention, Preparedness and Response (EPPR) Field Guide
  - Alaska Clean Seas Tactics Manual
- The Joint Industry Program (JIP) has enhanced our understanding of Arctic spill response and efficiencies of response techniques



## Oil Spill Removal Organizations

- Many throughout the U.S. to lead or supplement response efforts
- Oil Spill Liability Trust Fund
- Basic Ordering Agreement
- Pollution Removal Funding Authorization for agencies or governments



## Oil Spill Removal Organizations

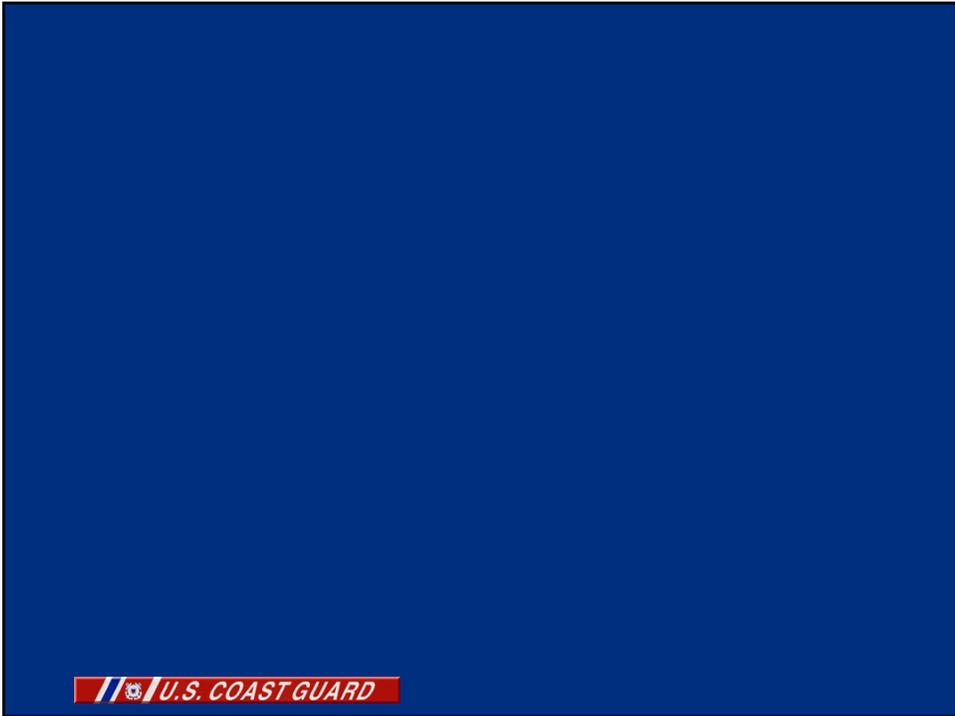
- Near Shore recovery will be led by a local OSRO
- Open Water recovery will be augmented by a local OSRO
- Sub-Contractors will be employed to supplement the lead OSRO
- All activities performed under the OSLTF



## Challenges

- Weather/Season
- Remote location/Logistics
- Lack of infrastructure/Improvising
- Distance of response capabilities/Logistics
- Limits of spill response equipment/Availability
- Safety of responders
- Joint Training/Coalition Exercises
- Funding
- Agreements/MOU/LOU
- International Media Interest/Visibility





# Questions & Comments





# NW Arctic Ecological Risk Assessment Consensus Workshop

## Basics

- October 18-20 2011 Anchorage
- November 16-17 2011 Kotzebue
- 53 attendees from 17 organizations
- Objectives:
  - Evaluating and improving oil spill response strategies
  - Enhancing oil spill contingency planning

## Approach

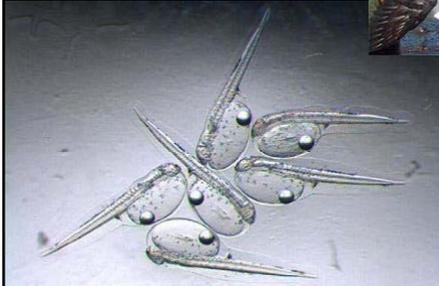
- Introductory presentations on
  - Scenario
  - Resources at risk
  - Response technologies
- Four focus groups (2 sessions)
- Evaluated risks and benefits of response options
  - Session 1: natural recovery, mechanical recovery, in-situ burning
  - Session 2: dispersants



## Scenario

- 400,000 gallon release
- IFO 180 fuel
- Fuel carrier grounded near Little Diomed Island
- 7-8 August
- Dispersant application (40% effectiveness)

# Resources at risk



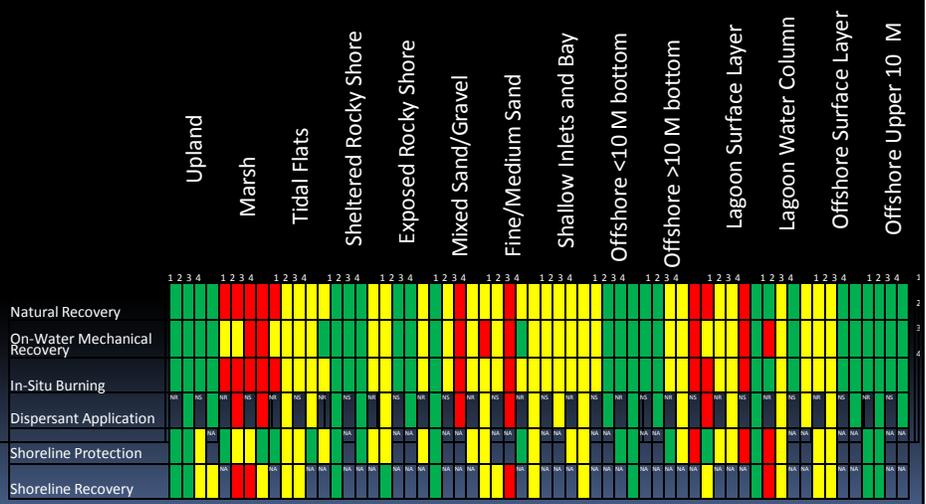
# Conclusions (1)

- Specific Concerns Identified for

- Upland
- Marsh
- Tidal flats
- Sheltered rocky shore
- Beaches
- Lagoon bottom
- Subtidal bottom <10m water depth
- Lagoon surface and water column
- Offshore surface and water column



# Conclusions (2)



## Recommendations (1)

- Engage locals in area planning
- Build response capacity in villages
  - Training
  - Equipment
  - Exercises
  - Create a Village Response Team
- Expand understanding of threats and response options
- Exchange traditional and western knowledge- especially include traditional knowledge of currents

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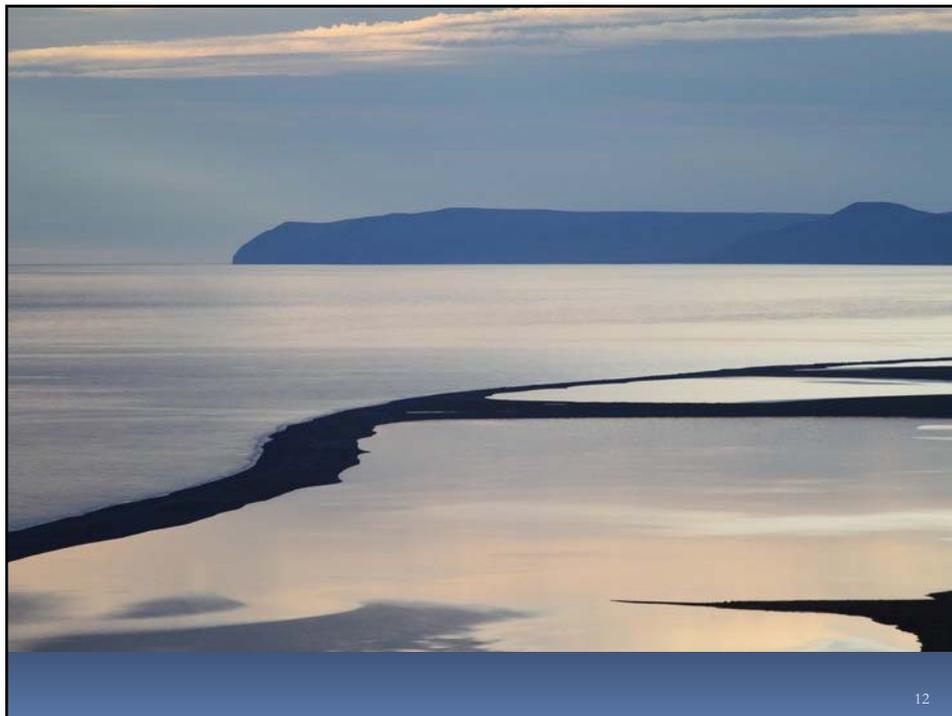
## Recommendations (2)

- Conduct a Bering Strait risk assessment
- Support shore zone mapping and baseline habitat information
- Dispersants:
  - More communication on risk and benefits
  - Additional research in cold water
  - Ensure availability

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## Summary

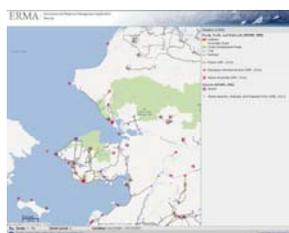
- ERA workshop was beginning of response dialog
- Specific concerns were identified to consider and build on at this workshop
- Subsistence/cultural use is a MAJOR concern





## Environmental Response Management Application

Amy Merten, Ph.D., Michele Jacobi  
NOAA's Office of Response and Restoration  
Allison Bailey (Sound GIS)  
Hayley Pickus, JB Huyett (Genwest Systems)



Kotzebue, AK  
May 22-23, 2012

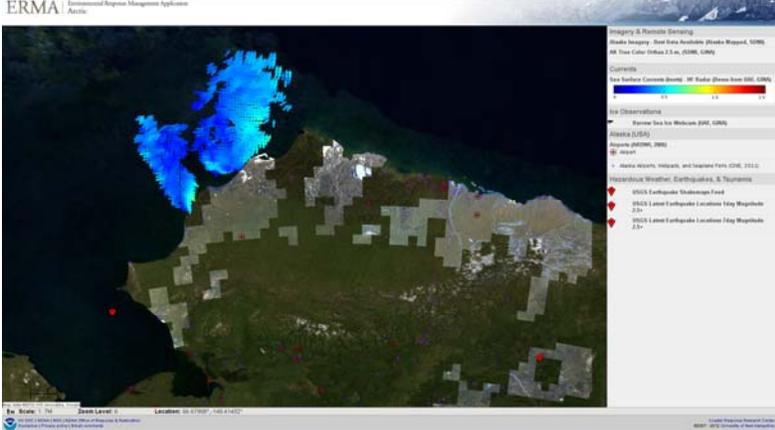
## Arctic Communities Workshops

- NWAB/Kotzebue – May 22-23, 2012
- North Slope Borough (Tentative)
- Establish understanding of oil spill response, NRDA and ERMA
- Identify local knowledge data and information
- Initiate agreements to protect local knowledge/information

NOAA | National Ocean Service | Office of Response and Restoration

## What is ERMA?

ERMA is an online mapping tool for visualizing environmental information relevant to oil spills and natural disasters.



ERMA Environmental Response Management Application  
Arctic

Imagery & Remote Sensing  
Hazard Response - Real Time Analysis (Hazard Mapping, 100%)  
Oil Spill Containment (Oil Spill, 100%)  
Oil Spill Containment (Oil Spill, 100%)

Currents  
Sea Surface Currents (NOAA Hydrographic Survey, 100%)  
Sea Surface Currents (NOAA Hydrographic Survey, 100%)

Ice Observations  
Remote Sensing (NOAA, 100%)  
Remote Sensing (NOAA, 100%)  
Remote Sensing (NOAA, 100%)

Historical Weather, Earthquakes, & Tsunamis  
USGS Earthquake Catalogs Feed  
USGS Earthquake Catalogs Feed  
USGS Earthquake Catalogs Feed  
USGS Earthquake Catalogs Feed

Scale: 1:100,000,000  
Zoom Level: 1  
Location: 66.1700°N, 150.000°W

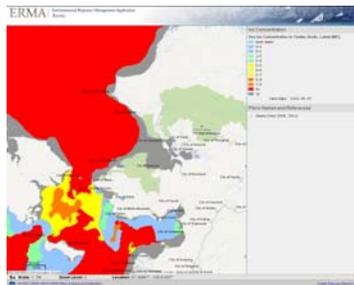
NOAA | National Ocean Service | Office of Response and Restoration

## Arctic ERMA Project

- Funded by NOAA, OSRI and BSEE
- Integrated with the Arctic Council EPPR Working Group
- Key Workshop (Anchorage, AK – Apr 5/6, 2011):
  - Diverse participation
  - Identify and prioritize data for inclusion
  - Arctic Communities Work Shops emerged
- Alaska Ocean Observing System (AOOS) – Data services/method development
- UAF/GINA (Geographic Information Network of Alaska) – Data services/method development
- NWAB – GIS Subsistence Mapping Project

## What is ERMA?

- Web-based mapping tool
- Provides centralized access to information
- Increases communication, coordination, and efficiency
- Prepare for, respond to, assess impacts from hazardous incidents or conditions
- Analyze and visualize environmental information relevant to all hazards



## Use ERMA to...

Visualize the situation status during an oil spill drill



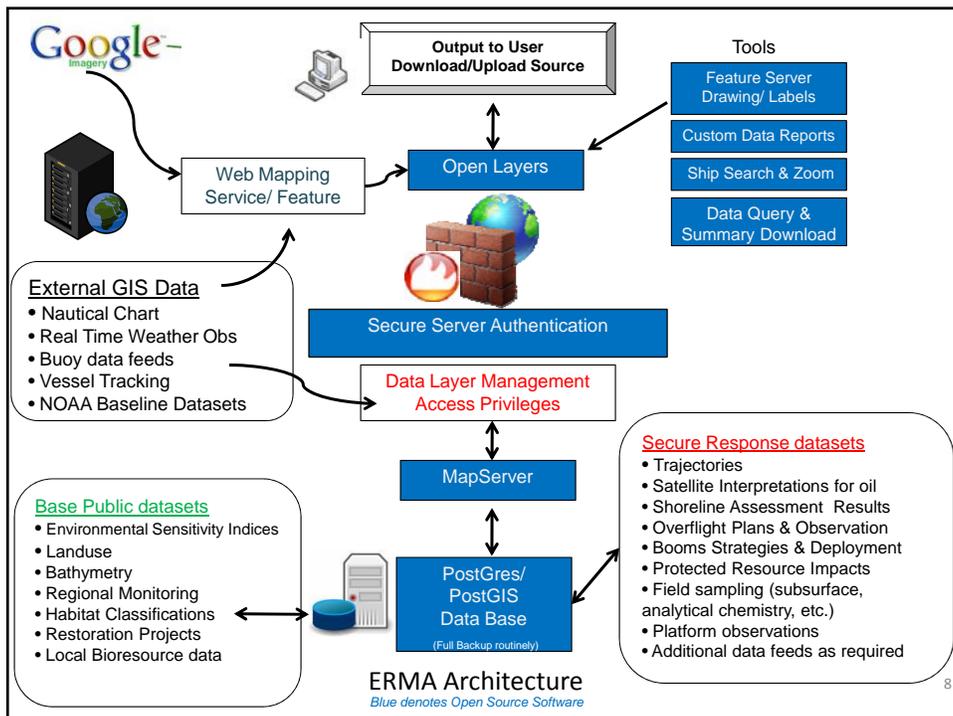
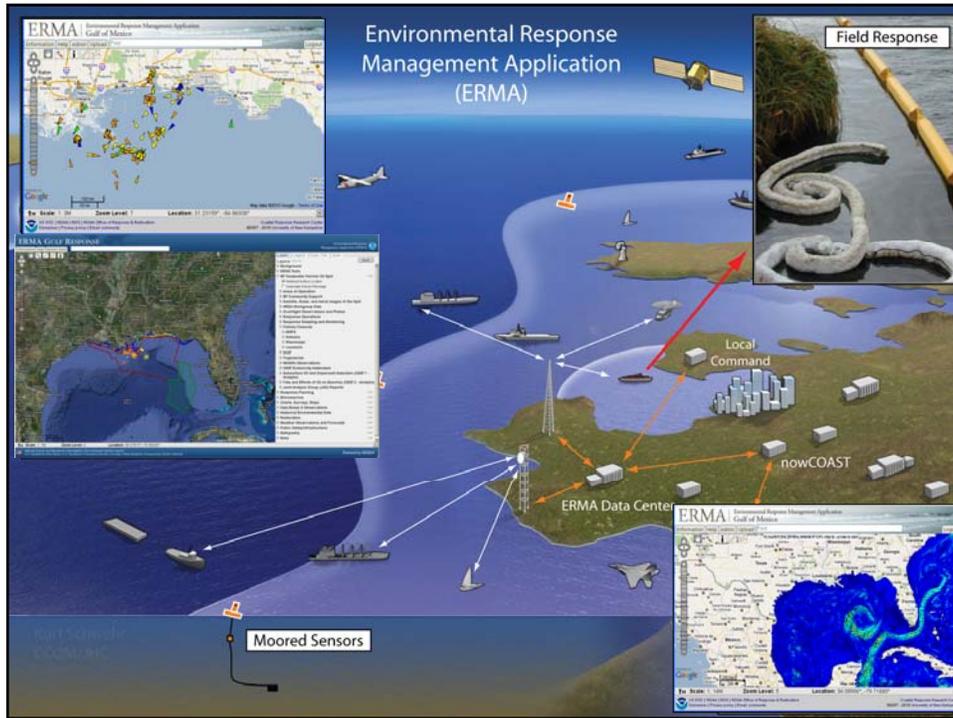
Assess damage and plan for restoration



Analyze threats from climate change, drilling, and hurricanes



Create a Common Operational Picture in a disaster response



## How ERMA Can Help

- **Data Collection, Visualization, and Sharing**
  - Cross Jurisdictional boundaries (Multi Agency, Multi State, Multi Cultural)
- **Resource Information**
  - Subsistence, cultural, sacred sites and access
  - Sensitive habitats
  - Species distribution and life history
- **Critical Infrastructure**
  - Airport and landing areas
  - Water intake locations
  - Communication centers
- **Aid in the development of Response Plans**
  - Environmental Sensitivity Index (ESI) maps
  - Area Contingency Planning (ACP)
  - Geographic Response Plans (GRP)

## Account Access

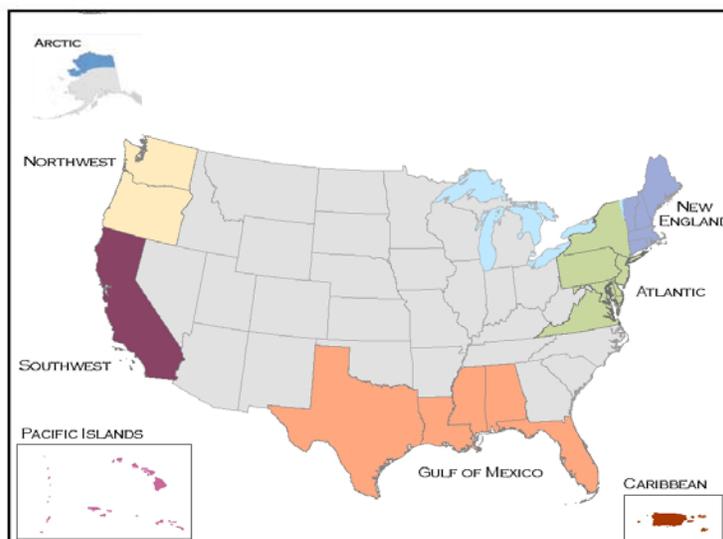
- **Public Side**
  - All publicly available data
- **Restricted Account Side**
  - Username/password required
  - Verified by NOAA
  - Various levels of access
    - Active incidents
    - Sensitive datasets
    - Natural Resource Damage Assessment (NRDA)
    - Drills

## Benefits

- Accessed via any Web browser, do not need special software
- Secure access to sensitive data sets
- Communicate with the public\*
- Improved collaboration across agencies and organizations through common view



## Where is ERMA?



## Types of Information in ERMA

- **Base Mapping**
  - Aerial imagery, terrain, roads
  - Nautical charts
- **Response Planning**
  - Equipment locations
  - Infrastructure
- **Incident Information**
  - Trajectories
  - Real time resource tracking
  - Shoreline oiling
  - Sampling data
- **Weather & Buoys**
  - Hurricane/Storms
  - Remote-sensing imagery
- **Resources at Risk**
  - NOAA ESI data layers
  - Shorezone
  - Local habitat and species
  - Seafood safety
- **Documents & Photo Links**
  - ESI and GRP .pdfs
  - Attached to layers
  - Field photos

## Goals of Arctic ERMA

- **Represent area of significant activities**  
(US-Canadian Beaufort and Chukchi Sea to south of the Bering Straits)
- **Include international partners**
- **Leverage existing data/programs; not creating new data**
- **Common platform specifically focused on spill response**
  - Demonstrated success during Deepwater Horizon → transferred platform to Arctic

### Arctic ERMA Timeline

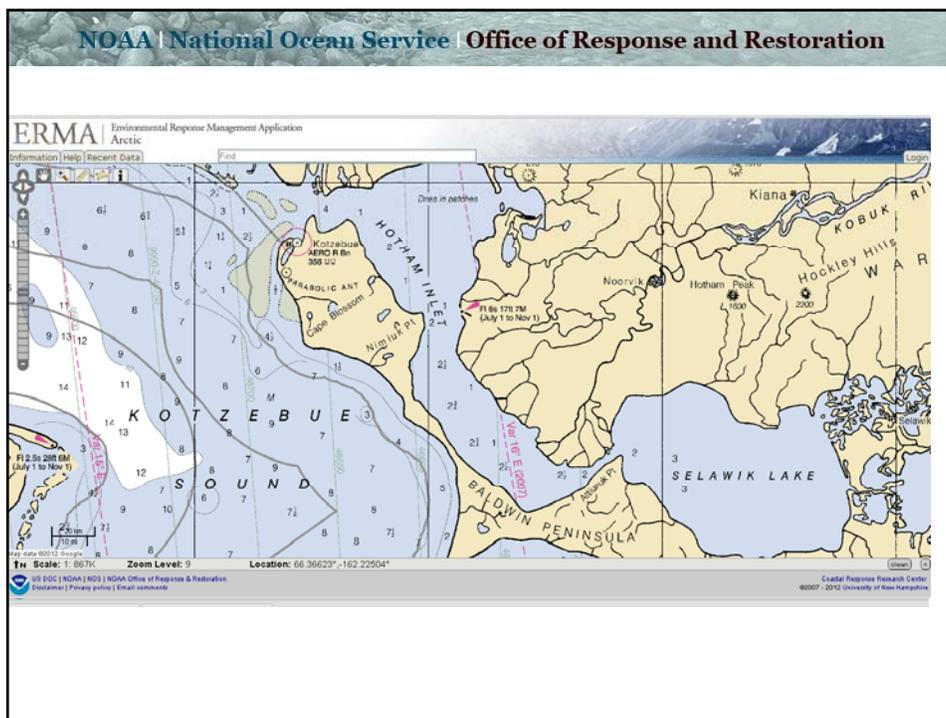
- Oil in ice research (05 to present)
- Arctic Disasters Workshop (Mar 08)
- US Arctic Research Commission (09/10)
- US Arctic Council (AMSA and EPPR – 08-Present)
- Partial funding NOAA Coastal Zone Planning in FY 10
- Arctic NRDA Workshop (Apr 10)
- Arctic ERMA Stakeholders Workshop (Apr 11)

### NOAA/BSEE (~500K)

- Enhance/finish Arctic ERMA before exploratory drilling commences
- Tasks:
  - Finish acquiring key data sets (Jun 2012 for “launch”)
  - Develop “stand-alone” ERMA
  - Training/drills
  - Operations/Maintenance
  - Infrastructure solution?

## Continued Partnerships

- Arctic Communities
- AOOS/CIRCAC
- UAF
- Canada (US/Canadian MOU)
  - David Kennedy/David Grimes
  - Arctic ERMA Canadian Workshop
    - July 2012, Edmonton (Tentative)
    - EPPR
- Arctic Council/EPPR





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ERMA | Environmental Response Management Application  
Arctic

2012-05-17 10

**Barrow Webcam**  
2012-05-17 10:40

Click here for full size image

[http://feeder.gma.alaska.edu/webcam-uaf-barrow-seaice-images/2012\\_05\\_17\\_10\\_40.html](http://feeder.gma.alaska.edu/webcam-uaf-barrow-seaice-images/2012_05_17_10_40.html)

Imagery & Remote Sensing  
Alaska Imagery - Best Data Available (Alaska Mapnet, USNS)  
AK Tree Color Outlines 2.5 m, (GDM, GMA)

Currents  
Sea Surface Currents (Beaufort - HI Radar (From USNS, GMA))

Ice Observations  
Barrow Sea Ice Webcam (GMA, GMA)

Alaska (USA)  
Alaska (GDM, 2500)  
Airport

Hazardous Weather, Earthquakes, & Tsunamis  
USNS Earthquake Shakepage Feed  
USNS Latest Earthquake Locations 7day Magnitude 2.5+  
USNS Latest Earthquake Locations 7day Magnitude 2.5+

Scale: 1: 2M Zoom Level: 0 Location: 66.6

UAF ALASKA UNIVERSITY OF ALASKA  
GINA GROUND INFORMATION NETWORK

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## Real-Time Weather Data Feeds

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Arctic

Information | Help | Admin | Upload | Find | Logout

Layers | Legend | Query Tools | AOI | Labels | Zoom | Download | Print

**Weather Observations and Forecasts**

Sea Surface Temperature Analysis  
32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72 74 76 78 80 82 84 86 88 90 92 94 96 98 100

Valid At: Wed Jun 6

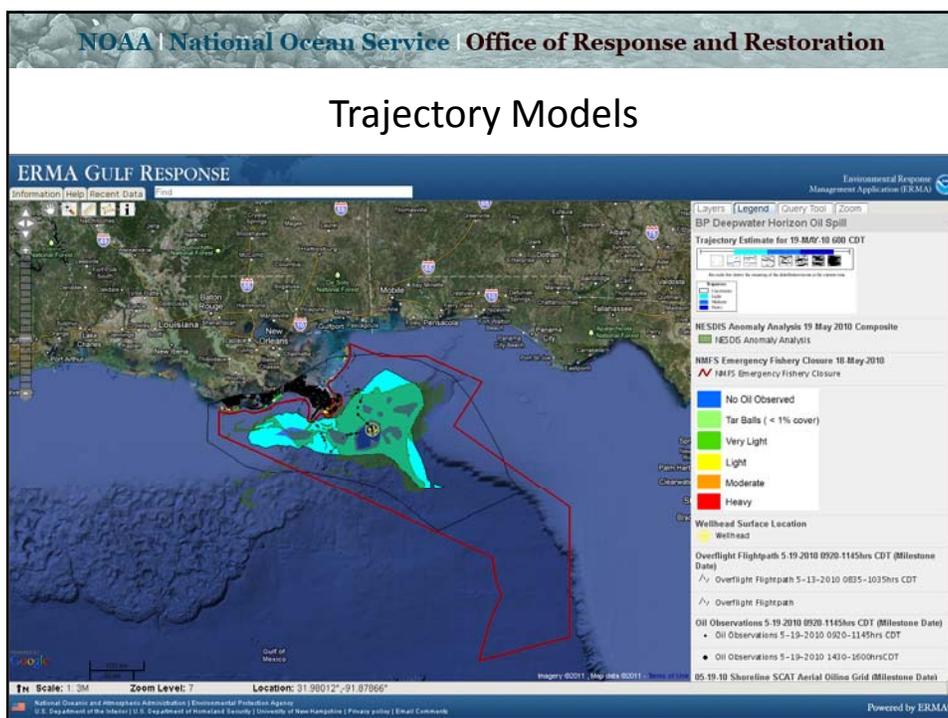
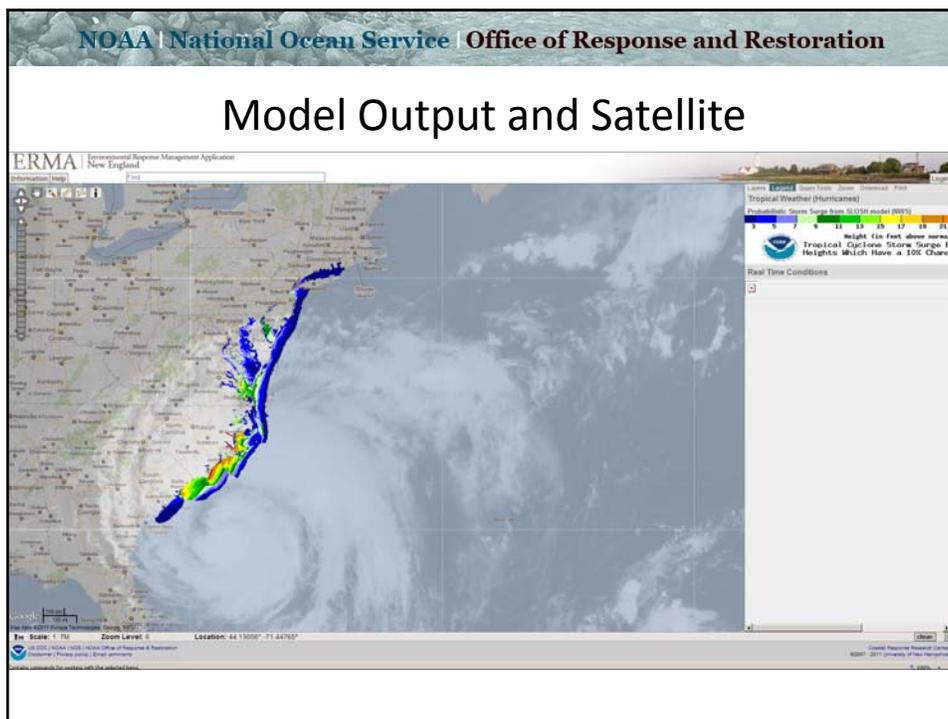
Surface Winds (Knots)  
Calm Example:  
5 Knots  
10 Knots  
50 Knots  
Clearing from NW at 25 Kts.  
Valid At: Thu Jun 6 2:15 PM EDT

DAYTIME	FID	ID	OBS TIME	RSPOKT	SPOKT	SPDMH	WINDDIR	_LAYERID	_SHAPE
1614	2826	PABR	135300	5	7	8	60	OBS_MET_WIND	[Geometry]

Scale: 1: 26M Zoom Level: 4 Location: 61.31245°,-144.09668°

US DOC | NOAA | NDS | NOAA Office of Response & Restoration  
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## Response Imagery

ERMA Environmental Response Management Application  
New England

Information | Help | Admin | Upload | Find

Layers Legend Query Tools AOI Labels Zoom Download Print

Layers:  Background  
 Base  
 Hurricane Irene  
 Bioresources  
 Charts, Surveys, Ships  
 Data Buoys & Observations  
 Environmental Quality  
 ERMA Tools  
 Imagery and Remote Sensing  
 NOAA Aerial - Hosted by Telascience  
 NOAA Aerial 2011-08-31 (Telascience)  
 NOAA Aerial 2011-08-29 (Telascience)  
 NOAA Aerial 2011-08-28 (Telascience)  
 NOAA Aerial 2011-08-28 (Telascience)  
 FEMA Aerial - Hosted by Telascience  
 FEMA Aerial 2011-08-30 (Telascience)  
 NASA MODIS  
 Response Planning  
 Restoration Projects  
 Marine Debris  
 Public Safety Infrastructure  
 Weather/Environmental Observations  
 September 2011 Drill

Scale: 1: 1093 Zoom Level: 15 Location: 35 59433° -75 46277°

US DDC | NOAA | NOS | NOAA Office of Response & Restoration  
 Coastal Response Research Center  
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## Shipping Routes & Incident Locations

ERMA Environmental Response Management Application  
Arctic

Information | Help | Admin | Upload | Find

Layers Legend Query Tools AOI Labels Zoom Download Print

Transportation  
 US Shipping Routes

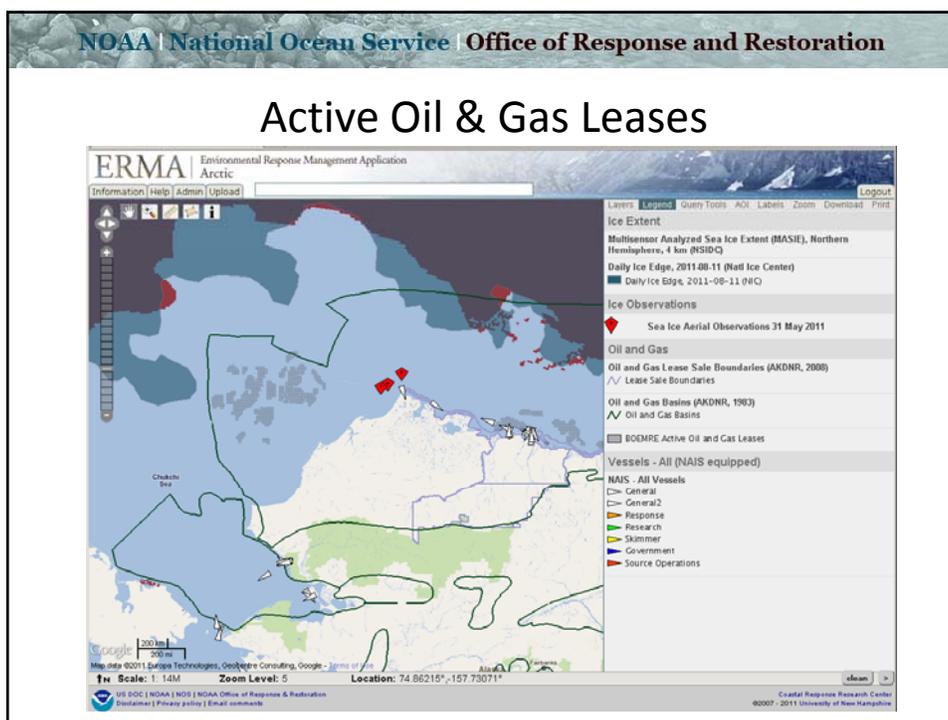
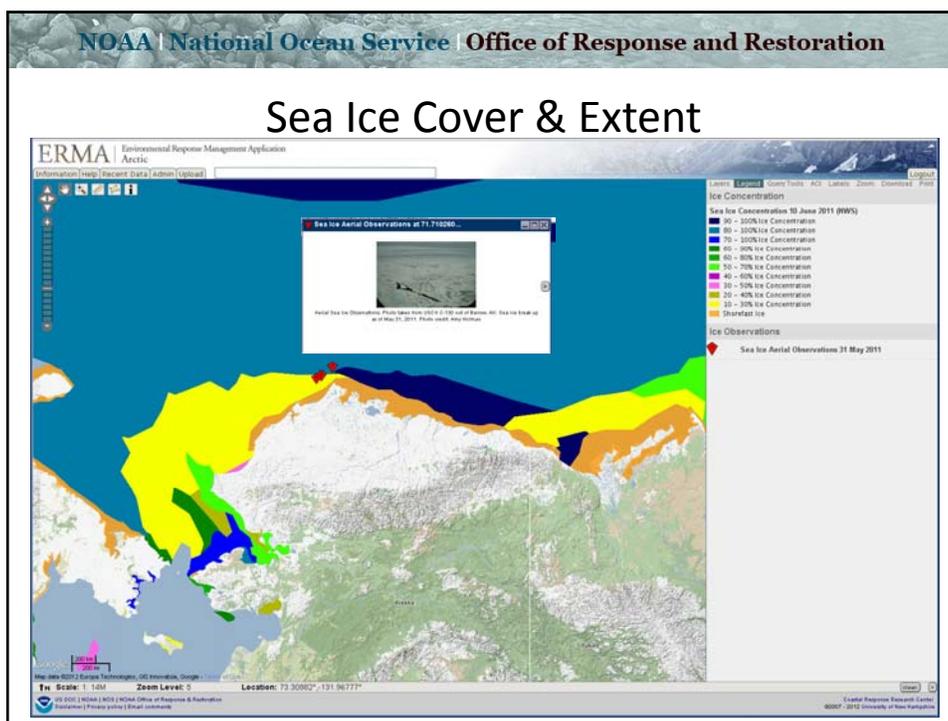
Hazards  
 Arctic Marine Shipping Assessment (AMSA) Incident Locations  
 Collision  
 Damage to Vessel  
 Fire / Explosion  
 Grounded  
 Machinery Damage / Failure  
 Sunk / Submerged  
 Miscellaneous

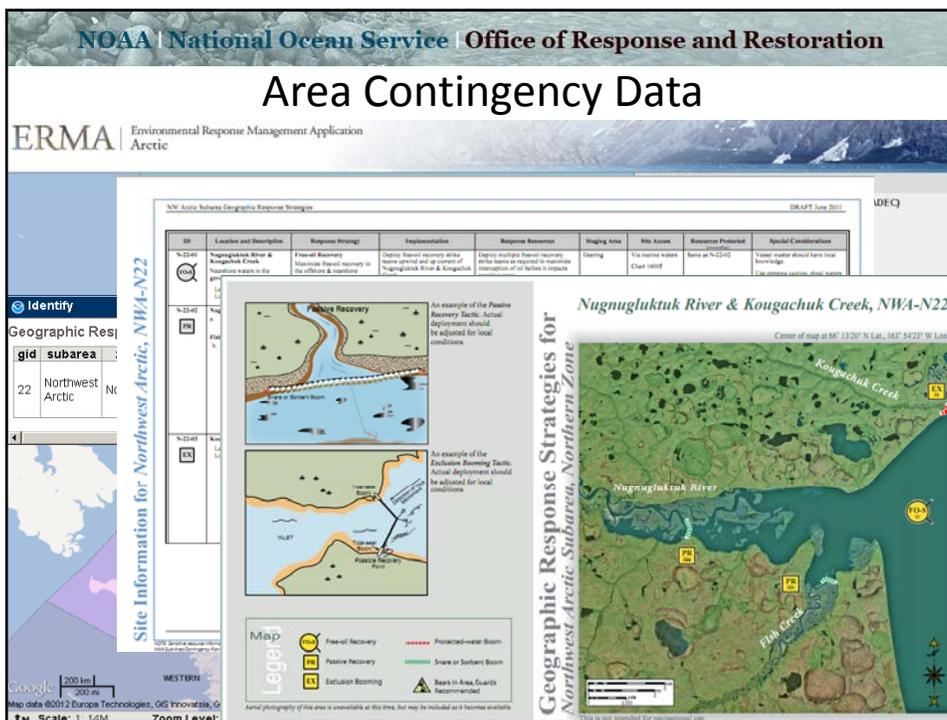
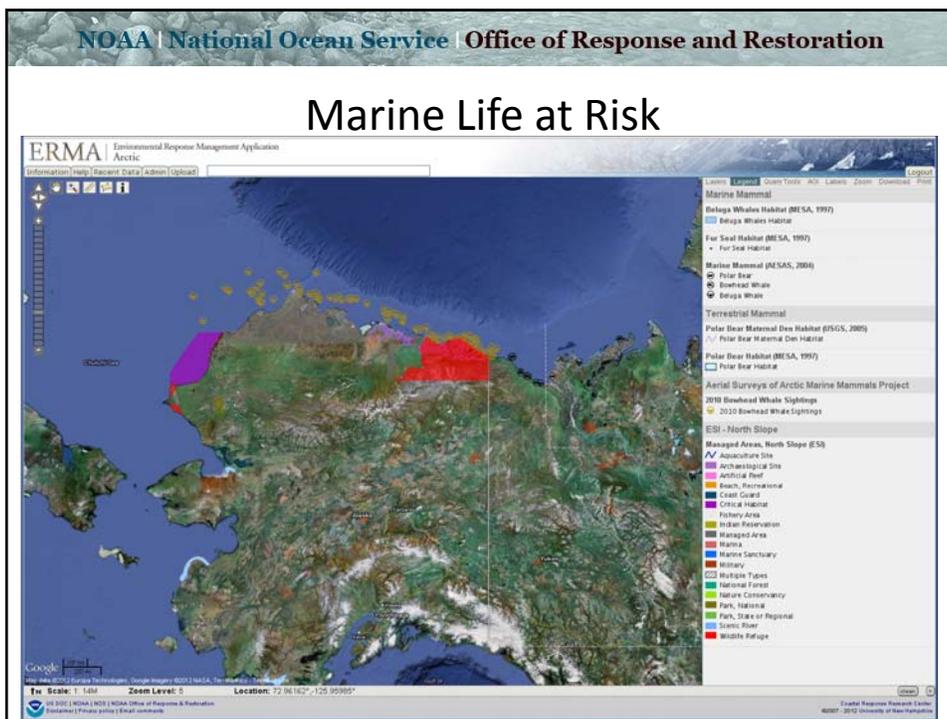
Identify  
 Arctic Marine Shipping Assessment (AMSA) Incident Locations

gid	source	type	date	latitude	longitude	lives_lost	fuel_spill	total_loss	ice_damage	primary_re	descrip
123	TSB	PASSENGER SHIP	1998-08-22	64.675	-168.258333	NO	NO	NO	NO	DAMAGE TO VESSEL	CRACK IN BILGE SH PLATING 8 WATER BALLAST TANK PO TANK BEI MONITOR VISUALLY EVERY

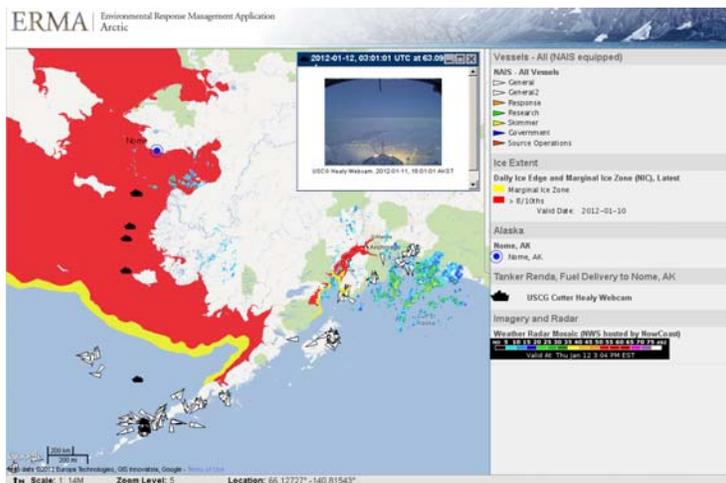
Scale: 1: 1093

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 Coastal Response Research Center  
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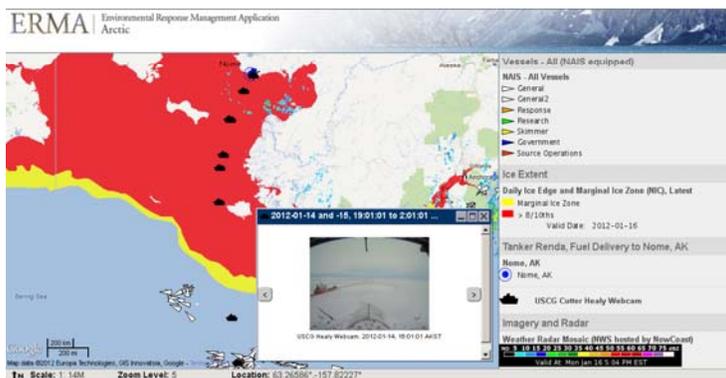


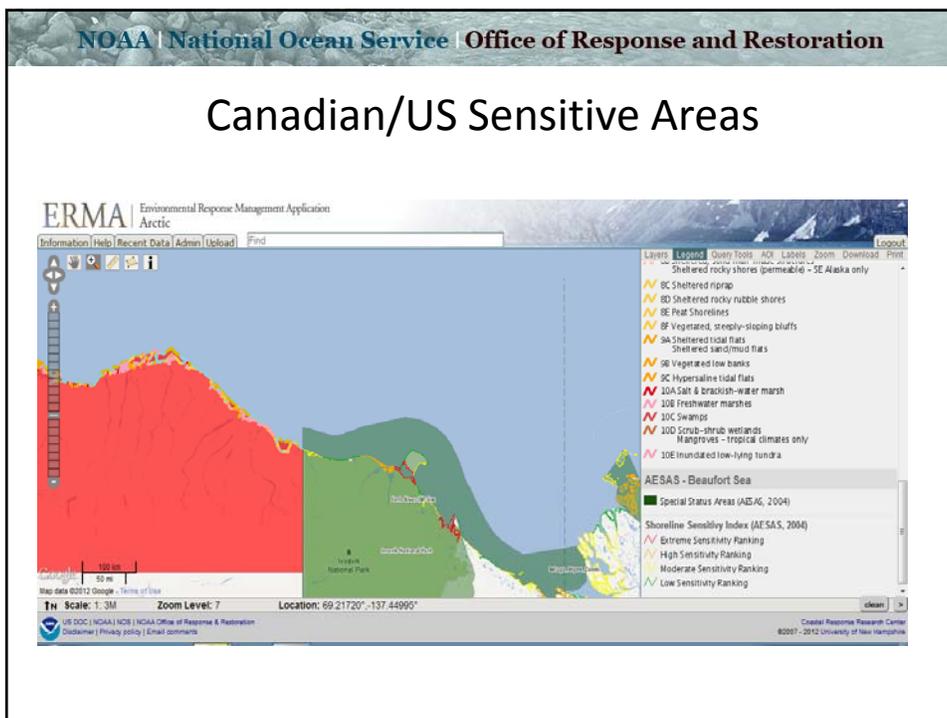
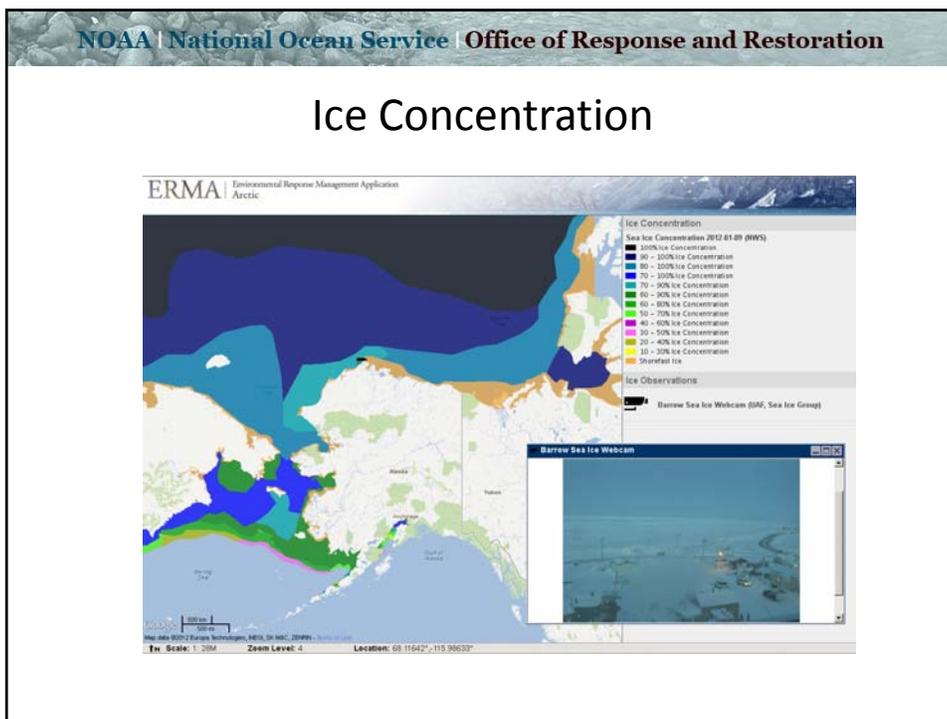


# Healy/Renda Event



# Renda Fuel Delivery







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## Data & Mapping Technology Best Practices

- Documented Data Development
  - Must have metadata!
- Data Accessibility
  - Make data available so others can use it
- Planning and Preparedness
  - Not just in crisis mode
- Data Sharing Agreements
  - Focus on what you know, share with others for what you don't, avoid duplication

## Interactive Tools

- Zoom To
- Bookmark Map Views
- Areas of Interest
- Measurement Tools
- Animations
- Full Metadata Access
- Find tool
- Map Labels
- Print Tools
- Interactive Query Tools
- Identify tool

## Arctic ERMA Next Steps

- Work with Arctic Communities to incorporate local knowledge
- Continue data acquisition in U.S./Canadian Arctic
- Work with other countries to access the key data sets
- Collaborate with other mapping entities (ACE, AOOS/CIRCAC, Arctic Net, UAF)
- Launch Date: Summer 2012
- Participate in Training/Drills of opportunity



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Office of **Response and Restoration**

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  - George Graettinger
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DAMAGE ASSESSMENT, REMEDIATION, & RESTORATION PROGRAM

**DARRP**

Office of Response and Restoration • Office of Habitat Conservation • General Counsel for Natural Resources



# Introduction to Natural Resource Damage Assessment

## Topics

- Overview
- Legal: Laws and Regulations
- NRDA Process
- Scaling Injuries and Restoration
- Restoration in the Arctic
- Summary



## Top Three Things to Know

- Three liabilities from oil spills
  - Injury to public natural resources
  - Response
  - 3<sup>rd</sup> party claims
- NRDA is restoration-focused
  - Restoration is considered early and throughout the process
  - Injuries are balanced against, and directly scaled to restoration
- NRDA is a Legal Process
  - Must demonstrate causality between release and injury
  - Defensible science is key to success
  - Effects of oil must be on top of baseline condition

3

An oil spill is like a house fire



Response is intended to stop further harm



## Restoration rebuilds



## Restoration compensates for loss



## NRDA: What is it?

- A process to determine
  - Injuries to or lost use of the public's natural resources
  - to restore, rehabilitate, replace, or acquire the equivalent of injured natural resources and services
- NRD success is measured by amount of appropriate restoration achieved



## Natural Resource Damage Assessment

- Amount of restoration implemented must EQUAL amount of injury that occurred



## Goal of NRDA

To Balance Injury with Restoration



## Oil Pollution Act (1990)

- Applies Public Trust Doctrine
- Polluter pays – compensatory not punitive
- Requires cooperation with polluter
- Requires public involvement
- Restoration must "restore, rehabilitate, replace, and acquire the equivalent" of injured natural resources and services

## Damage Assessment Responsibilities

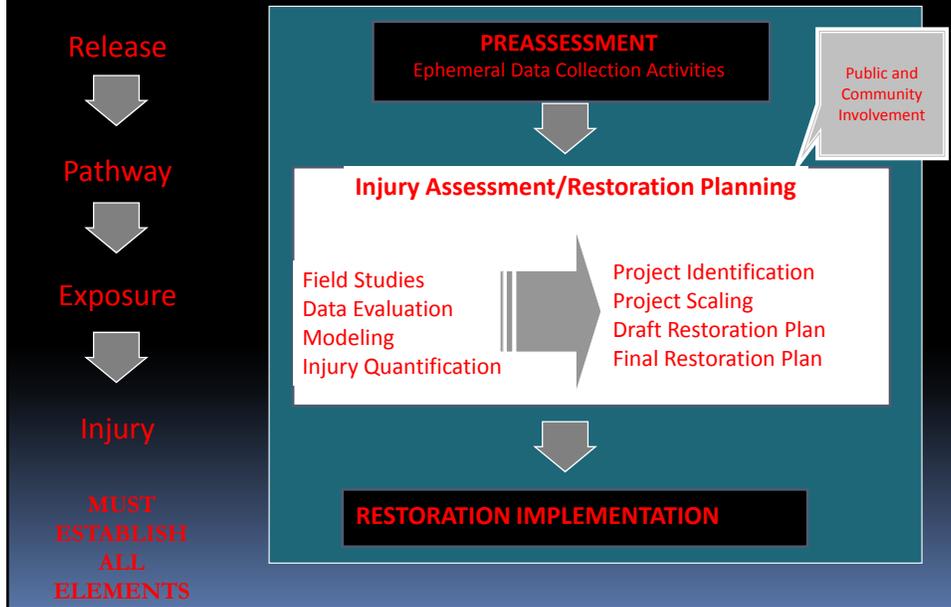
- Coordinate w/response agencies (USCG)
  - Integrate concerns and science into cleanup
- Assess injuries: What was harmed?
- Evaluate Restoration: What can be done to
  - Return resources to baseline?
  - Compensate for lost resources and services?
- Oversee and/or implement
  - restoration projects
- Recover assessment costs



## NRDA Does Not Address

- Civil and criminal liability (CWA, OCSLA)
- Damages to real or personal property
  - Net loss of taxes, royalties, rents, fees, and other lost revenues by federal or state governments
  - Loss of profits or loss of earning capacity due to injury to natural resources
  - Net costs of public services

# Natural Resource Damage Assessment



## OPA 90 Definition of Injury

- ... *an observable or measurable adverse change in a natural resource or impairment of a natural resource service. .... incorporates ... "destruction," "loss," and "loss of use" ....*



# Injuries and Restoration

**Habitat:** sub-tidal, inter-tidal, beach, estuarine, marsh

**Resources:** fish, marine mammals, birds, wildlife

**Lost Use:** fishing, hunting, bird watching

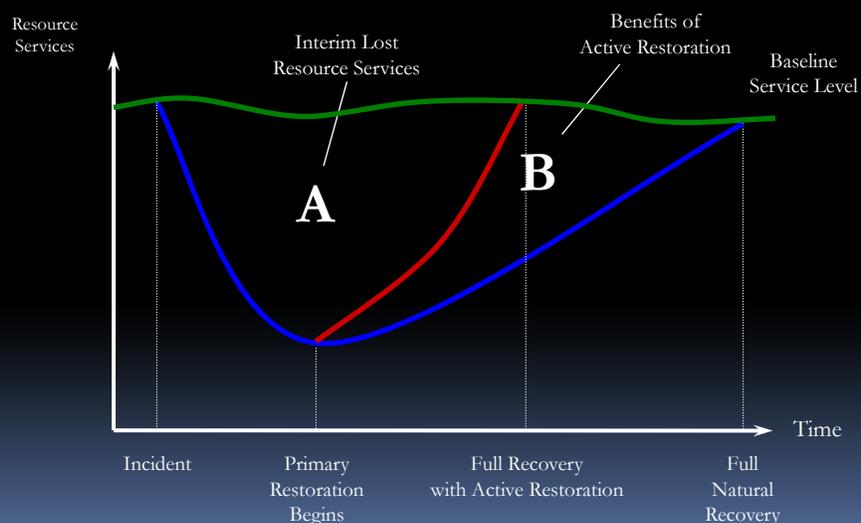


## Focus on Restoration

- **Primary Restoration**
  - Actions taken to stop release and promote recovery
- **Compensatory Restoration**
  - Actions taken to compensate for interim lost uses

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# Restoration Benefits



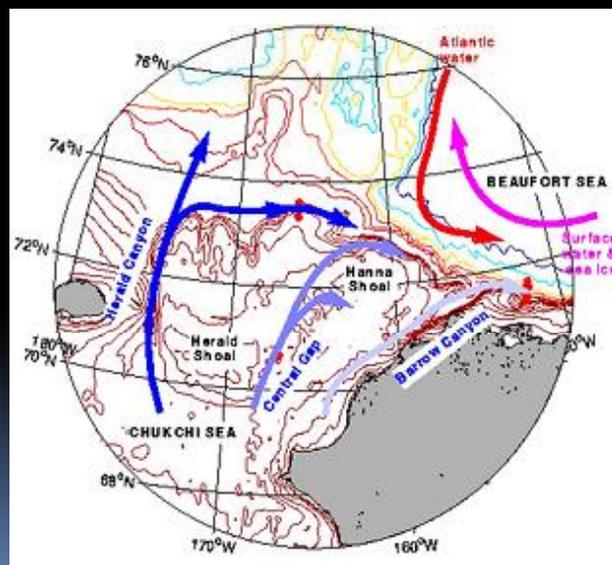
18

## STEP 1: What Happened?

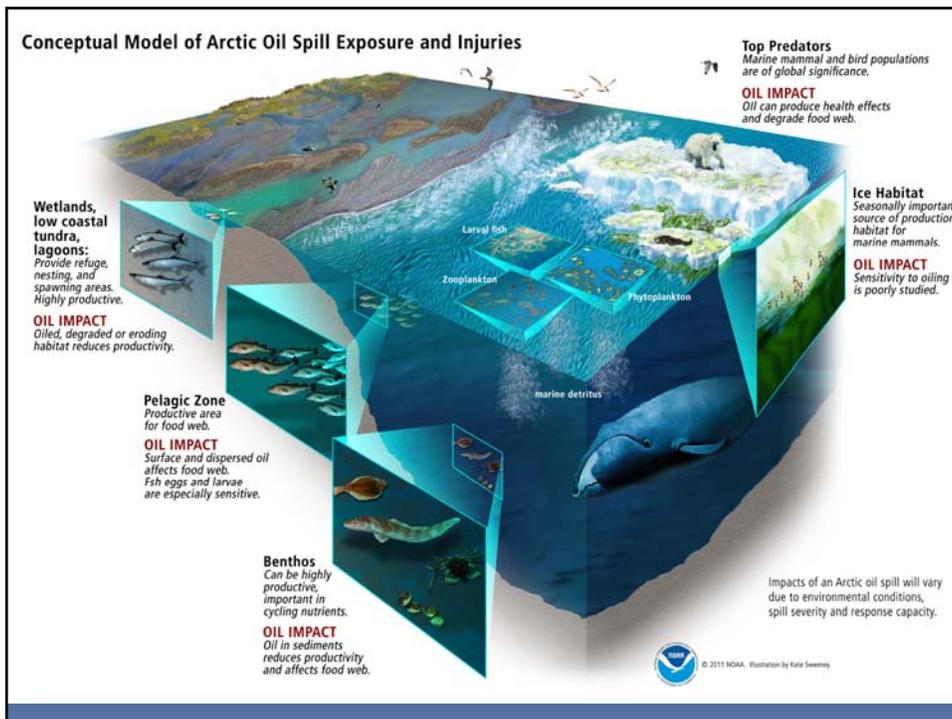
- How is oil reaching natural resources?
  - Physical transport pathways (floating on water, current driven transport, stranding on shorelines, sinking, evaporation)
  - Biological pathways (dermal contact, ingestion of water, prey consumption, inhalation)
- What animals and habitats could be exposed?
- What life stages are most sensitive to oil effects?
- How could they be affected (what injuries would you expect? )
- How are people using the resources?

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## Major Currents



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## STEP 2: Injury Assessment

- Verify pathways
- Identify resources at risk
- Evaluate exposure
- Measure injuries and compare with baseline
  - Habitat
  - Animals
  - Human Use



## Defining Baseline

- Condition “but-for” the spill
  - Comparison to “pre-spill” conditions?
    - is baseline changing?
  - Comparison to appropriate reference sites?
  - Consider confounding factors and competing hypotheses
    - Physical degradation of habitat
    - Presence of other contaminants
    - Climate change

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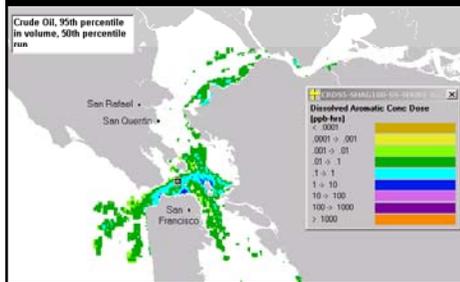
## Evaluating Exposure

- Field Measurements
  - Water concentrations
  - Sediment/soil concentrations
  - Oil degradation rates
  - Invertebrate tissue
  - Fish bile
  - Blood parameters
- Modeling
  - Oil type and volume
  - Weather, current, tides, wind
  - Observations of oil fate
  - Calculated water concentrations
  - Calculated air concentrations

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## Evaluating Injury (1)

- Species
  - Field measurements
  - Lab studies
  - Extrapolate from previous spills/literature
- Modeling
  - Biological population estimates
  - Life history tables
  - Toxicity values
  - Production foregone



## Evaluating Injury (2)

- Habitat Injuries
  - Extrapolating from individual species metrics
  - Integrated to "total" service losses
- Human Use Injuries
  - Document geographic and temporal extent of lost use
  - Boat access, fishing, hunting areas



## Injury Assessment Considerations

- Endpoints must be related to oil effects
- Endpoints should be translated into resource and service loss and restoration
- Have a clear objective for sampling-hypothesis driven or to document exposure conditions
- Use pre-approved protocols
- Clear, accurate, and complete documentation is critical
  - QA documentation
  - Chain of Custody
  - Photos

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## Cooperating with the PRP

- Required under NRDA rules – Trustees decide timing, duration, decision making process, level of participation, agreements, public involvement
- Executive Order: Facilitation of Cooperative Conservation (Aug. 26, 2004) calls for Federal agencies to cooperate
- Outcome of cooperative NRDA is a legal agreement—a consent decree

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## Injury Assessment What is Needed for Success

- Coordination with
  - response agencies
  - PRPs
- Framework for
  - cooperative planning
  - robust scientific evidence
  - objective decision-making
  - public participation
  - funding



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## Natural Resource Services

- Services are fundamental to the determination of interim losses and for scaling restoration
- Services have value because humans care about them
- Services are functions that one resource performs for another or for humans
- A single resource may provide a variety of services

## Categories of Natural Resource Services

- Ecological
- Cultural/Historical
- Sustenance
- Commercial
- Recreational
- Passive/Existence

## STEP 3: Restoration Planning

- Compensate for what is injured
  - What is injured?
  - How badly is it injured
  - What could be replaced/restored/acquired?
  - How much is needed?



## Service-to-Service Approach

### Framework

- Services lost and must equal those gained through restoration projects
- Conditions for use:
  - Injured and restored resources and services are the same type, quality, and of comparable value
- Encompasses
  - Habitat/Resource equivalency analysis (HEA/REA)
  - Methods predicting direct human use

## Habitat Equivalency Analysis (HEA)

- Calculates compensation for interim lost services
- Habitat services over time is the currency
- Requires that values per unit of lost services and replacement services are comparable (if not, HEA is still applicable if value differences are known)

## Habitat Equivalency Analysis - Basic Steps

- Document and quantify the injury in terms of services
- Identify and evaluate replacement project options
- Document and quantify services of the replacement project
- Determine scale of project to compensate for the injury over time

## Scale to Compensate for the Injury Over Time

- Compute lost service flows (lost acre years) over time from injury until recovery under likely cleanup scenario
- Compute replacement service flows (gains) from restoration over time
- Scale the restoration project so that total discounted service flows gained are EQUAL TO total discounted service flows lost from injury

## Arctic Restoration Options

- Marine mammals
- Birds
- Vegetation
- Fish passage
- Marine debris removal
- Cultural enhancement

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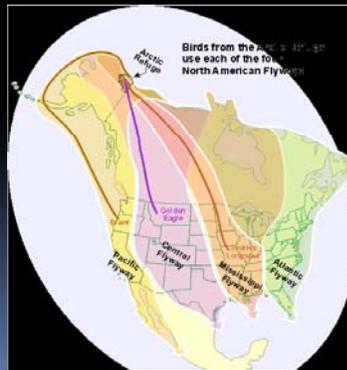
## Restoring Marine Mammals

- As ice changes, polar bear and walrus spend more time on land
- Restoration options:
  - Reduce negative polar bear-human interactions
  - Minimize disturbance of walruses
  - Habitat Protection/Marine Protected Areas



## Restoring Birds

- Limiting factors:
  - prey base, predation, habitat limited; other sources of mortality...
  - contamination, disturbance, hunting



## Bird Restoration Ideas

- Large-scale invasive predator removal –fox removal
- Bury powerlines that kill birds in fog
- Clean up existing contaminated sites along coast
- Habitat protection (acquisition, easements) wetlands mitigation banks



## Restoring Vegetation

- Seed or transplant sod or wetland plants: Native grass cultivars or climax species (indigenous species)
- Fertilizer (generally phosphorus)
- Thermokarst (depressions from melting permafrost)
- Rehabilitation activities could exacerbate existing impact
- No-action may be the most appropriate course
- Arctic rehabilitation (natural or assisted) is a slow process

## Restoring Coastal Habitat

- Fish passage/fish habitat
  - Placement of culverts to prevent thawing of the permafrost and subsequent settling of the culvert
  - Culverts placed at correct depths
  - Maintaining flow during late summer



## Restoring Human Use

- Citizen Environmental Monitoring (Canada)
  - water temp, fish health, abundance data
  - based on science and traditional knowledge
- Camp Sivunniigvik (Camp Sivu)
  - Language preservation
- Camp Qunqaayu (Culture Camp)
  - Kuroshima Oil spill settlement
    - re-introduce cultural values
    - introduce language
    - promote awareness of natural resources
    - passing on the knowledge of the elders

## OSLTF: NRD Claims

- Claims can be submitted for past or future:
  - Emergency restoration costs
  - Assessment costs
  - Restoration Costs
- Claim requirements:
  - Restoration Claim – Measured or observed injury
  - Based upon a publicly-reviewed Restoration Plan
  - First presented to a Responsible Party
  - Submitted within 3 years of completion of Final Restoration Plan

## Summary

- Oil Pollution Act requires restoration of injured resources
- Injuries can be ecological or socioeconomic/cultural
- Restoration of oiled Arctic natural resources will be challenging